



# A/E/C CADD Standard

Release 3.0

September 2006



The A/E/C CADD Standard is compliant with Version 3.1 of the U.S. National CAD Standard

The A/E/C CADD Standard contains supplemental materials and DoD specific requirements not addressed in the U.S. National CAD Standard.



September 2006

# **A/E/C CADD Standard**

**Release 3.0**

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# Preface

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## Introduction

The A/E/C CADD Standard Manual has been developed by the CADD/GIS Technology Center (CGTC) for Facilities, Infrastructure, and Environment to eliminate redundant Computer-Aided Design and Drafting (CADD) standardization efforts within the Department of Defense (DoD) and the Federal Government. The manual is part of an initiative to Develop a nonproprietary CADD standard that incorporates existing industry, national, and international standards and to develop data standards that address the entire life cycle of facilities within the DoD. The A/E/C CADD Standard Manual is part of a set of standards being developed by the CGTC. Additional manuals include the following:

- a. Contract Language Guidelines for Acquiring Geospatial Data (CADD, GIS, CAFM) System Deliverables from Architect-Engineer (A-E) Consulting Firms,  
<https://tsc.wes.army.mil/products/standards/aeguide/index.asp>
- b. Spatial Data Standard for Facilities, Infrastructure, and Environment (for more information, please contact Nancy Blyler at [Nancy.J.Blyler@hq02.usace.army.mil](mailto:Nancy.J.Blyler@hq02.usace.army.mil))

Information on these standards, unless otherwise noted, can be obtained from the CGTC's Web page at <https://tsc.wes.army.mil>.

Mr. James T. Wilson is the Acting Chief of the CGTC, which is located in the Information Technology Laboratory (ITL), U.S. Army Engineer Research and Development Center (ERDC), Vicksburg, MS. The Director of ITL is Dr. Jeffery P. Holland, and the Assistant Director is Dr. Deborah F. Dent. At the time of publication of this report, the Director of ERDC was Dr. James R. Houston. Commander of ERDC was COL Richard B. Jenkins.

## **United States National CAD Standard**

In 1995, the combined resources of the CGTC, the American Institute of Architects (AIA), the Construction Specifications Institute (CSI), the United States Coast Guard, the Sheet Metal and Air Conditioning Contractors National Association (SMACNA), the General Services Administration (GSA), and the National Institute of Building Sciences' (NIBS) Facility Information Council began an effort to develop a single CADD standard for the United States. Working together, these organizations agreed to develop an integrated set of documents that collectively would represent the U.S. National CAD Standard (NCS).

A Memorandum of Understanding (MOU) was signed on August 8, 1997. In accordance with that MOU, Release 3.0 of the A/E/C CADD Standard follows, utilizes, or references the work developed by each of the signatories. The two main documents referenced within Release 3.0 of the A/E/C CADD Standard are:

- “Uniform Drawing System”  
The Construction Specifications Institute  
99 Canal Center Plaza, Suite 300  
Alexandria, VA 22314-1588  
<http://www.csinet.org>
- “AIA CAD Layer Guidelines”  
The American Institute of Architects  
1735 New York Avenue, NW  
Washington, DC 20006-5292  
<http://www.aia.org>

Each of these documents is available as part of the U.S. National CAD Standard. Additional information on the U.S. National CAD Standard can be obtained from

NIBS Facility Information Council  
National Institute of Building Sciences  
1090 Vermont Avenue NW, Suite 700  
Washington, DC 20005-4905  
<http://www.nationalcadstandard.org>

# 1 Introduction

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## Acronyms

First, a few useful acronyms:

- A-E – Architect-Engineer
- A/E/C – Architectural, Engineering, and Construction
- AIA – American Institute of Architects
- ANSI – American National Standards Institute
- ASTM – American Society for Testing and Materials
- BIM – Building Information Modeling
- CAD – Computer-Aided Design
- CADD – Computer-Aided Design and Drafting
- CGTC – The CADD/GIS Technology Center
- CSI – Construction Specifications Institute
- DoD – Department of Defense
- FM – Facility Management
- GIS – Geographic Information System
- IAI – International Alliance for Interoperability
- IFC – Industry Foundation Class
- ISO – International Organization for Standardization
- NCS – National CAD Standard

- NIBS – National Institute of Building Sciences
- SI – International System of Units (Le Système International d’Unités)
- UDS – Uniform Drawing System

## **Scope**

This manual provides guidance and procedures for preparing Computer-Aided Design and Drafting (CADD) products within the Department of Defense (DoD).

Chapters 1-5 of this manual address topics such as presentation graphics, level/layer assignments, electronic file naming, and standard symbology. Appendices A-D contain tables on model and sheet file level/layer names, color comparisons, as well as Architectural, Engineering, and Construction (A/E/C) CADD symbology.

## **Purpose**

The purpose of this manual is to set a basic CADD standard to ensure consistent electronic deliverables (products) within the DoD. These consistent deliverables are part of a comprehensive installation life-cycle management strategy. This manual sets a CADD standard specifically for the A/E/C disciplines of facilities development and civil works projects. As this manual evolves, it will be integrated with other standards initiatives by the CADD/GIS Technology Center (CGTC) for Facilities, Infrastructure, and Environment such as Contract Language Guidelines and Building Information Modeling (BIM).

## **Background**

The immediate benefits of CADD standards are many: consistent CADD products for customers; uniform requirements for A-E deliverables; sharing of products and expertise; and collection, manipulation, and exchange of database information. Recognizing such potential benefits, each of the DoD agencies independently initiated efforts to establish CADD standards in the late 1980's. The Air Force Logistics Command (1989) released the "Architectural and Engineering Services for CADD Implementation Within Air Force Logistics Command." Headquarters, U.S. Army Corps of Engineers (1990), published Engineer Manual 1110-1-1807, "Standards Manual for U.S. Army Corps of Engineers Computer-Aided Design and Drafting (CADD) Systems." In 1993, the

Naval Facilities Engineering Command distributed its “Policy and Procedures for Electronic Deliverables of Facilities Computer-Aided Design and Drafting (CADD) Systems.”

To consolidate these efforts into a single standard, the CGTC was tasked to develop standards for the A/E/C disciplines. This manual presents the CGTC’s effort at standardizing CADD requirements for A/E/C design and construction documents.

## **International System of Units (SI) Considerations**

For this standard manual, the impact of the SI, more commonly referred to as the metric system, on such items as drawing scales, sheet sizes, and dimensioning is addressed. The SI was established by the General Conference of Weights and Measures of 1960, as interpreted or modified from time to time for the United States by the Secretary of Commerce under the authority of Public Law 94-168, the Metric Conversion Act of 1975, and the Metric Education Act of 1978. As of January 1, 1992, in accordance with Public Laws 94-168 and 100-418, the Omnibus Trade and Competitiveness Act of 1988, and Executive Order 12770, “Metric Usage in Federal Government Programs,” July 25, 1991, all new and revised construction standards and criteria must be developed using the SI.

## **Future Technologies**

There are several ongoing initiatives to create a universal language for collaborative work in the area of building and construction software. This work stems from the need to automate current building and construction tasks to become more efficient and cost effective. One of these initiatives is by the International Alliance for Interoperability (IAI), a nonprofit building industry alliance comprising architects, engineers, contractors, software vendors, government agencies, research laboratories, and universities. The goal of the IAI is to unite the A/E/C and Facility Management (FM) businesses by specifying Industry Foundation Classes (IFCs) as a universal language. The concept behind the IFCs is to create a series of standard intelligent software objects for the building industry that allow all process disciplines (i.e., architects, designers, engineers, builders, facilities managers) to exchange information. The IAI is developing IFCs that allow current software packages such as AutoCAD and MicroStation to share building and construction data. IFCs would improve the quality of the life cycle of a building from construction through maintenance and ultimately to demolition through reduced expense and delivery time, enhanced communications, and increased discipline proficiency.

## **Target Systems**

This manual does not target any specific CADD system or software. However, to ensure successful translations among CADD applications, certain system-specific characteristics were considered and the standard adjusted accordingly. During the preparation of the standard, several baseline decisions were made:

- The standard must be applicable to the latest release of commercially available CADD packages. AutoCAD and MicroStation were chosen based on their prevalence in the DoD.
- The standard is based on CADD applications that utilize layer/level names and reference files.
- The standard requires every final plotted drawing sheet to have its own separate electronic drawing file.

Since there have been considerable improvements and updates to CADD software, including changes to the file formats, it becomes more important to have a standard version of each appropriate CADD platform. Based on this, the following versions of the primary software products are considered the standard versions for use:

- MicroStation Version 2004 (ver. 8.5)
- AutoCAD 2004

## **Design Applications and Other Applications**

Numerous design applications have been developed to run on top of basic CADD engines. These applications can be used by designers to generate graphics inside CADD files. Most notable are design software packages for civil/site and Building Information Modeling (BIM).

Document management systems that contain attributes for individual files and have such features as title block integration are becoming standard tools for management of electronic files. Use of these systems to store searchable attribute information on files is encouraged.

## **Coordination with Design Agent**

With all the complexity and options currently available in the world of CADD, it becomes important to coordinate fundamental aspects of design work. The previously mentioned issues of basic platform, design applica-

tions, and document management are only three of the issues that can affect the success of a project and the future usefulness of the final documents. As such, each project should have at its initiation discussions and agreements on such issues as this. Each software package being used should be approved and a determination made on how much of the supporting electronic files should be provided to the customer as a part of the end product.

## Additions/Revisions

This standard is intended to be neither static nor all-inclusive and thus will be updated and enhanced as appropriate. Suggestions for improvements are strongly encouraged so that subsequent updates will reflect the input and needs of CADD users.

Recommendations or suggested additions should be sent to:

The CADD/GIS Technology Center  
U.S. Army Engineer Research and Development Center  
ATTN: CEERD-ID/Spangler  
3909 Halls Ferry Road  
Vicksburg, MS 39180-6199  
or by e-mail at: [Steve.C.Spangler@erdc.usace.army.mil](mailto:Steve.C.Spangler@erdc.usace.army.mil)

# 2 Drawing File Organization

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## Design Area

### Available drawing area

The two most extensively used CADD applications within the DoD, AutoCAD and MicroStation, both provide for a drawing area with infinite range in each positive and negative axis (x,y,z).

### File accuracy (units)

CADD systems allow the designer to work in “real-world” units. The most common units are feet:inches, feet:tenths of feet, and meters:millimeters.

MicroStation’s approach to file accuracy allows the user to set the working units (i.e., real-world units) as the following:

- Master Units = The largest unit that may be referred to when working in the design file (e.g., feet, meters)
- Sub Units = Subdivisions of Master Units (e.g., inches, millimeters)

**Note:** *For MicroStation V8, changing the Master Units in a drawing no longer changes the size of design file elements. For instance, if a design file was created in feet and a 1-ft line is drawn, changing the Master Units to inches results in the line measuring 12 in.*

*For MicroStation V8, Positional Units have been eliminated (since these previously determined the size of the design cube and the ultimate accuracy of the file). Positional Units can still be set using the Settings – Design File – Working Units – Advanced button, but this is not recommended (unless the design file is going to be saved back to a MicroStation V7 file).*

In AutoCAD, the basic drawing unit for any file is the distance between two fixed Cartesian coordinates. For example, the distance between coordinates (1,1,1) and (1,1,2) is one drawing unit. A drawing unit can correspond to any measurement (e.g., foot, inch, meter, mile, fathom). AutoCAD users may enter the **Units** display option to set the desired drawing units.

The **Units** command of AutoCAD does not have a direct metric system setup. For metric designs, the recommended procedure is to choose the **Decimal** option in the **Drawing Units** dialogue box. This will allow each drawing unit to represent decimal meters, millimeters, etc., at the discretion of the user.

### **International Feet versus Survey Feet (V8)**

Many sites have to deal with the initial question as to whether a particular project is designed using International Feet or Survey Feet. In some states, it is specified by statute that units of measure for grid coordinates have to be either International Feet or Survey Feet. The two units are defined as follows:

- International Feet: 1 foot = 0.3048000 m
- U.S. Survey Feet: 1 foot = 0.3048006 m

Looking at this comparison, the difference between the two (0.0000006 m) may seem insignificant; however, ultimately this difference may cause coordinate values to be off by several feet, resulting in inaccurate design files. In MicroStation V8, the **units.def** file does contain a definition for Survey Feet (usually stored in **Program Files\Bentley\Workspace\System\data**), but it is disabled by default. To enable, scroll down the **units.def** file to the section **English units (based on U.S. Survey Foot)** and delete the # in front of **#sf,ft**, which will allow for the selection of Survey Feet from the Working Units box the next time MicroStation is started.

**Note:** *If a drawing has already been created using International Feet, changing the Master Units to Survey Feet will not automatically scale all elements in the drawing to Survey Feet. To address this problem, several Districts and A-E firms have developed macros to correctly scale existing elements, some of which also help bring V7 drawings into V8 while maintaining survey foot measurements.*

### **Origin (global origin)**

Positioned within every electronic drawing file is an origin (“global origin” in MicroStation and “origin” in AutoCAD). The origin of a drawing file is important because it serves as the point of reference from which all other elements are located. Origins are typically defined in a drawing file by the Cartesian coordinate system of x, y, and z.

The benefit of standardizing the location of the origin of a drawing is most notable in the use of reference files (see section “Reference Files (XREFs)” in Chapter 4). A standardized origin is also helpful when translating files between CADD applications. The recommended global origin for 2D files in both AutoCAD and MicroStation drawings is x = 0 and y = 0. When 3D files are used, the z-origin should be set to allow for elevations below 0.

## **Model Files and Sheet Files**

Two distinct types of CADD files are addressed in this standard: model files and sheet files.

A model file contains the physical components of a building (e.g., columns, walls, windows, ductwork, piping, etc.). Model files are drawn at full scale and typically represent plans, elevations, sections, etc. Model files can be generated either by placing graphics or from BIM model extractions.

A sheet file is synonymous with a plotted CADD drawing file. A sheet file is a selected view or portion of referenced model file(s) within a border sheet. The addition of sheet-specific information (e.g., text, dimensions, and symbols) completes the construction of the document. In other words, a sheet file is a “ready-to-plot” CADD file.

Figure 2-1 illustrates how different model files are referenced to a sheet file (notice that even the border sheet is a referenced model file). Again, a sheet file is the combination of referenced model files with sheet-specific text/symbols to create a final ready-to-plot CADD file. A useful rule of thumb was stated in the 2nd edition of the American Institute of Architects’ (AIA) *CAD Layer Guidelines* (AIA 2005): “Model files are always referenced by other files, while sheet files are never referenced by other files.”

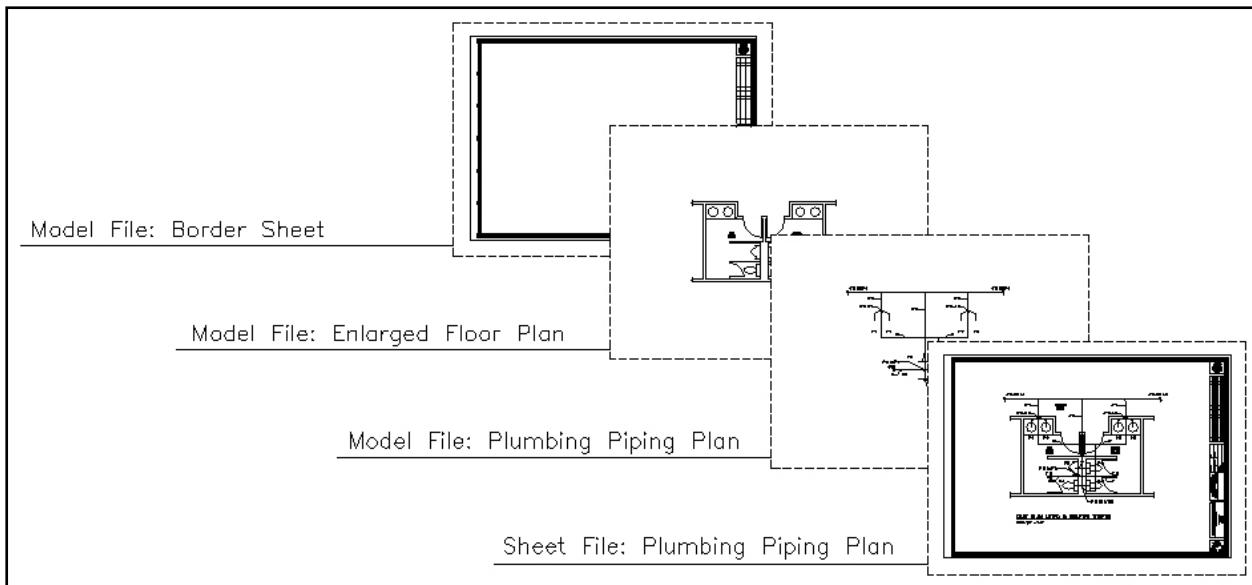


Figure 2-1. Sheet file composition

## Design Models and Sheet Models

Inside each CADD file can exist Design Models (or Model Space for AutoCAD users) and Sheet Models (or Paper Space for AutoCAD users). Design Models are where model files are developed or possibly where model files are assembled together prior to creation of the Sheet Model (see the following section “Drawing Sheet Assembly”). Design Models contain graphic information in a model file format. For example, it may contain the entire Architectural Floor Plan model file for a building. It is this model file that is used as a reference for creating individual sheet files.

By contrast, a Sheet Model shows the presentation of model file graphics as they would appear on an individual drawing sheet. This assembly area would contain referenced individual model files, one of which would be a border sheet.

## Drawing Sheet Assembly

Two main options for drawing sheet assembly may be used. Each involves assembling individual model files and a border sheet model file to create final plotted sheets. There are some differences that are explained in the following paragraphs. One similarity in both assembly processes is that nested referenced border sheet model files are not allowed. The method used should be defined at the start of a project, and all files should be built in the same manner.

## Option 1 – Use of Design Model and Sheet Model

This option is the preferred method of drawing assembly (new to MicroStation users, but common to AutoCAD users, who are used to Paper Space). It consists of using a sheet file that contains a Design Model and a Sheet Model. The Design Model is used to assemble all the individual reference files necessary to display the graphics. This may include references to individual views of Design Models in other files, or even coincident references. The Design Model should also contain real-world graphics such as northing and easting coordinate values of points. The Sheet Model contains a reference to the project border sheet model file (at 1:1), plus a reference to the Design Model in the active sheet file, scaled to fit into the Sheet Model (Figure 2-2).

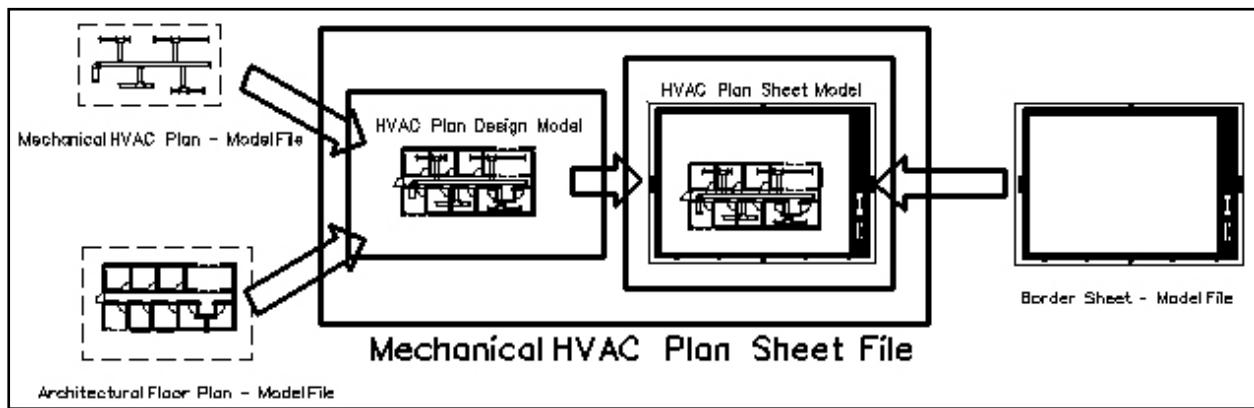


Figure 2-2. Sheet file composition using Design Model and Sheet Model

## Option 2 – Use of Design Model Only

This option consists of using the Design Model only (the Sheet Model (or Paper Space) is not used). This Design Model would have all model files referenced to it, including the border sheet model file. Since all work would be done in the Design Model, a determination should be made at the start of any project using this option on whether to scale up the border sheet model file to fit around the 1:1 model files, or scale down the model files to fit inside the 1:1 border sheet model file (Figure 2-3). Whichever method is chosen, it should be consistent throughout the project.

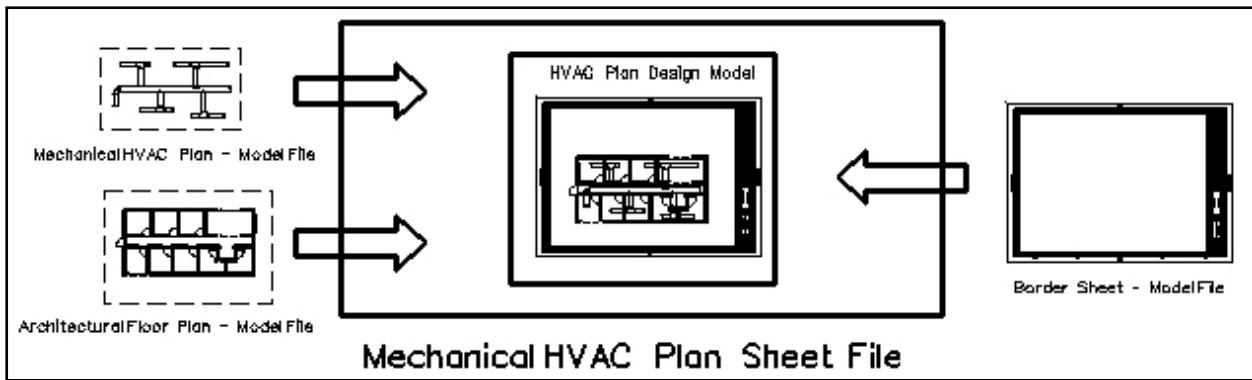


Figure 2-3. Sheet file composition using only the Design Model

## Electronic Drawing File Naming Conventions

Naming conventions for electronic drawing files (both model files and sheet files) allow CADD users to determine the contents of a drawing without actually displaying the file. They also provide a convenient and clear structure for organizing drawing files within project directories.

### Project Code

The Model File naming convention and the Sheet File naming convention both allow for a 0- to 20-character Project Code at the beginning of the file name. Use of a Project Code is recommended and should be identified at the start of each project to ensure consistent file names within that project. Some examples of Project Codes are:

- The official agency project number
- The project number defined by the agency system manager for their record system

The use of Project Codes in file names is highly recommended, because it prevents the same file name from existing in different directories. When this field is used, standard naming should consider use of a special character such as an underscore “\_” for all model files so that folder sorting routines group like files together.

When a project includes multiple sites or buildings, it is important to identify each file with the appropriate feature. This should be done as a part of the Project Code. For example, a model file for project P123, building 2, could possibly use a Project Code of “\_P123-Bldg2”.

## Model file naming convention

The model file naming convention (Figure 2-4) has one optional field, followed by three mandatory fields. While the first field is optional and may be omitted, the remaining fields must be used and in the correct sequence.

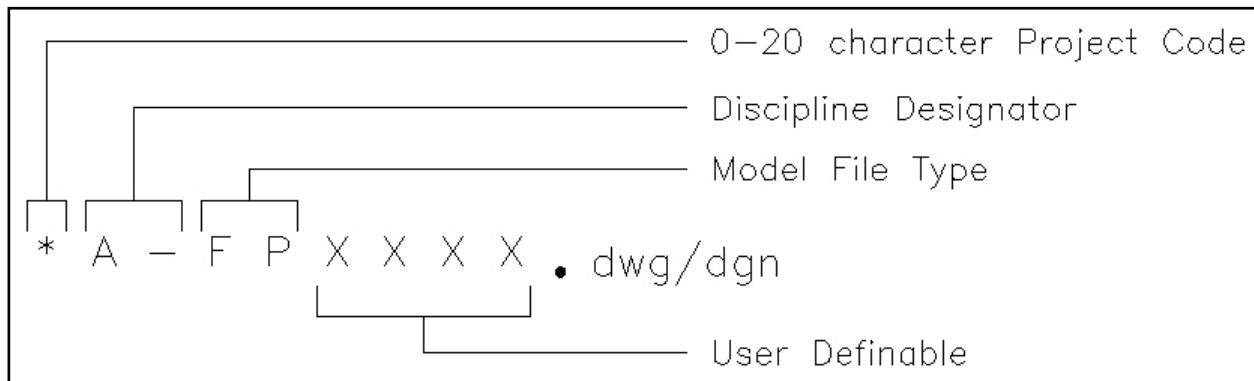


Figure 2-4. Model file naming convention

Following the optional Project Code field, the first two-character field represents the Discipline Designator. The allowable characters for the first character in the Discipline Designator field are listed in Table 2-1. The second character of the Discipline Designator field is always a hyphen “-”. The next two-character field represents the Model File Type (Table 2-2). The final four-character field is User Definable.

**Note:** Several CADD Standards implementation packages use the file name conventions to determine the type of file being created, so certain character fields need to be located in the same position in every file name. If not all of the User Definable characters are needed, placeholders must be used for these implementation tools to function properly.

**Example.** The model file name for a project at the U.S. Army Engineer Research and Development Center (ERDC), Building 8000, 1st floor, Architectural Floor Plan could be:

ERDC8000A-FPF1XX.dgn/dwg

where ERDC8000 is the Project Code, A- is the Discipline Designator, FP is the Model File Type (Floor Plan), and F1 is a user-definable set of characters for Floor 1. Since not all of the user-definable characters were used, the characters XX were used as placeholders.

**Table 2-1**  
**Discipline Designators**

Discipline	Designator
General	G
Hazardous Materials	H
Survey/Mapping	V
Geotechnical	B
Civil	C
Landscape	L
Structural	S
Architectural	A
Interiors	I
Equipment	Q
Fire Protection	F
Plumbing	P
Process	D
Mechanical	M
Electrical	E
Telecommunications	T
Resource	R
Other Disciplines	X
Contractor/Shop Drawings	Z
Operations	O

**Table 2-2**  
**Model File Types**

Discipline	Code	Definition
<i>General</i>	BS	Border Sheet
	CS	Cover Sheet
	KP	Key Plan
<i>Hazardous Materials</i>	DT	Detail
	EL*	Elevation
	LG	Legend
	PP	Pollution Prevention Plan
	QP*	Equipment Plan
	SC	Section
	XD*	Existing/Demolition Plan
<i>Survey/Mapping</i>	AL	Existing Airfield Lighting Plan
	CP	Existing Communication System Plan
	EU	Existing Electrical Utilities Plan
	HP	Existing Hydrographic Survey and Mapping Plan
	HT	Existing HTCW Utilities Plan
	LG	Legend
	PB	Property Boundary
	PR	Existing Profile
	SC	Existing Section

\* = No Model File Table available in Appendix A

(Continued)

**Table 2-2 (Continued)**

<b>Discipline</b>	<b>Code</b>	<b>Definition</b>
<i>Survey/Mapping</i>	SP	Survey and Mapping Plan
	UP	Existing Utilities Plan
<i>Geotechnical</i>	DT	Detail
	JP	Joint Layout Plan
	LB	Boring Log
	LG	Legend
	PV	Pavement Site Plan
	SC	Section
	SH*	Schedule
	SI	Subsurface Investigation Plan
<i>Civil</i>	AF	Airfield Plan
	BR	Beach Renourishment Plan
	DT	Detail
	EL	Elevation
	ER	Eco-Restoration Plan
	FC	Flood Control Plan
	GP	Grading Plan
	IP*	Installation Plan/Base Map
	JP	Joint Layout Plan
	KP*	Staking Plan
	LG	Legend
	NG	Navigation/Dredging Plan
	PL*	Project Location Map
	PR	Profile
	SC	Section
	SH*	Schedule
	SP	Site Plan
	TS	Transportation Site Plan
	UP	Utilities Plan
	XD*	Existing/Demolition Plan
<i>Landscape</i>	DT	Detail
	EL*	Elevation
	IP	Irrigation Plan
	LG	Legend
	LP	Landscape Plan
	SC*	Section
	SH*	Schedule
	XD*	Existing/Demolition Plan
<i>Structural</i>	3D	Isometric/3D
	BP	Bridge Plan
	CP	Column Plan
	CW	Misc. Small Civil Works Structures
	DT	Detail
	EL	Elevation
	EP	Enlarged Plan
	FC	Flood Control Structures

\* = No Model File Table available in Appendix A

(Continued)

**Table 2-2 (Continued)**

<b>Discipline</b>	<b>Code</b>	<b>Definition</b>
<i>Structural</i>	FP	Framing Plan
	LD	Locks and Dams
	LG	Legend
	NP	Foundation Plan
	SC	Section
	SH	Schedule
	XD*	Existing/Demolition Plan
<i>Architectural</i>	3D*	Isometric/3D
	AC	Area Calculations/Occupancy Plan
	CP	Reflected Ceiling Plan
	DT	Detail
	EL	Elevation
	EP*	Enlarged Plan
	FP	Floor Plan
	LG	Legend
	QP	Equipment Plan
	RP	Roof Plan
	SC	Section
	SH*	Schedule
	XD*	Existing/Demolition Plan
<i>Interiors</i>	3D*	Isometric/3D
	DT	Detail
	EL	Elevation
	EP*	Enlarged Plan
	FL	Floor Patterns
	LG	Legend
	QP*	Equipment Plan
	RP	Furniture Plan
	SC*	Section
	SH*	Schedule
	SP	Signage Placement Plan
	WP	System Furniture Plan
	XD*	Existing/Demolition Plan
<i>Fire Protection</i>	3D*	Isometric/3D
	DG*	Diagram
	DT	Detail
	FA	Fire Alarm/Detection Plan
	FP	Fire Suppression Plan
	LG	Legend
	LP	Life Safety Plan
	SH*	Schedule
<i>Plumbing</i>	3D*	Isometric/3D
	DG	Diagram
	DT	Detail

\* = No Model File Table available in Appendix A

(Continued)

**Table 2-2 (Concluded)**

<b>Discipline</b>	<b>Code</b>	<b>Definition</b>
<i>Plumbing</i>	EL*	Elevation
	EP*	Enlarged Plan
	LG	Legend
	PP	Piping Plan
	SH*	Schedule
	XD*	Existing/Demolition Plan
<i>Mechanical</i>	3D*	Isometric/3D
	DG	Diagram
	DT	Detail
	EL	Elevation
	EP*	Enlarged Plan
	HP	HVAC Plan
	HS	Hydraulic Systems
	HT	HTCW Utilities Plan
	LG	Legend
	MD	Machine Design Plan
	MH	Material Handling Plan
	QP*	Equipment Plan
	SC	Section
	SH*	Schedule
	SP	Specialty Piping and Equipment Plan
	XD*	Existing/Demolition Plan
<i>Electrical</i>	AL	Airfield Lighting Plan
	AP*	Auxiliary Power Plan
	CP	Exterior Communication Systems Plan
	DG	Diagram
	DT	Detail
	EU	Electrical Utilities Plan
	GP	Grounding System Plan
	LG	Legend
	LP	Lighting Plan
	PP	Power Plan
	SH*	Schedule
	SS	Special Systems Plan
<i>Telecommunications</i>	XD*	Existing/Demolition Plan
	DG	Diagram
	DT	Detail
	LG	Legend
	SH*	Schedule
	TP	Telephone/Data Plan
* = No Model File Table available in Appendix A		

**Existing/Demolition model file naming.** There are instances when a facility is being renovated and the as-built designs need to be revised to show demolition and new items. These revisions would not be made on existing as-built model files, but on copies to ensure the original as-builds are not modified.

A model file type, Existing/Demolition (XD), has been added to the standard to allow users to make revisions to as-built files. This model file type is used to aid users in separating existing-to-remain items from items that will be demolished.

**Example.** An architect has an existing as-built floor plan model file for Building 1000, 2nd floor. For the current project, walls will be demolished and new walls constructed on the 2nd floor. First, a copy would be made of the original as-built file (B1000A-FPF2XX.dgn/dwg) , and the copy would be named B1000RENA-XDF2XX.dgn/dwg (B1000REN is the Project Code, A- is the Discipline Designator, XD is the Model File Type (Existing/Demolition Plan), and F2XX are user-definable characters (F2=Floor 2)). The architect would open this file and move all demolition items to demolition levels/layers (see Chapter 4, “Status (phase) levels/layers”). When the new items in the Floor Plan are drawn, the architect would open a new model file called something like B1000RENA-FPF2XX.dgn/dwg (B1000REN is the Project Code, A- is the Discipline Designator, FP is the Model File Type (Floor Plan), and F2XX are user-definable characters (F2=Floor 2)). The file

B1000RENA-XDF2XX.dgn/dwg

would be referenced in with the demolition levels/layers turned off. The architect would then use the Floor Plan active levels/layers to construct the new items for that project.

### **Sheet file naming convention**

The sheet file naming convention (Figure 2-5) has one optional field for the Project Code, followed by four mandatory fields. Similar to the format for model file naming, all mandatory fields must be used and in the correct sequence.

The first field is entirely optional and can be used for a 0- to 20-character Project Code (see “Model file naming convention”). The next two characters are the Discipline Designator with Level 2 Designator (Table 2-3). The next character is the Sheet Type Designator (Table 2-4) followed by a two-character Sheet Sequence Number (01-99).

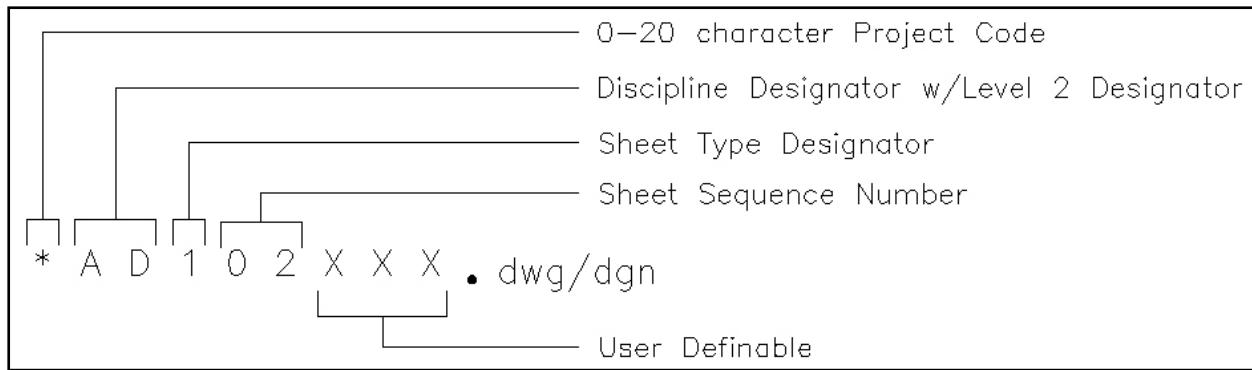


Figure 2-5. Sheet file naming convention

The remaining three characters are user definable.

**Note:** If the sheet sequence number goes above 99 sheets for a particular discipline, the first character in the User Definable field could be used to expand the limit of sheets per discipline to 999. However, if more than 99 sheets are required for one discipline's drawings, the user might want to consider using the Level 2 Designator in the Discipline Designator to further subdivide the discipline (Table 2-3).

**Note:** Occasionally, more than one Sheet Type (e.g., plan, elevation, detail) will be represented in one sheet file. If this is the case, the dominant Sheet Type determines the Sheet Type Designator.

For example, the sheet file name for a project at ERDC, Building 8000, 1st floor, Quadrant B, Architectural Floor Plan, sheet sequence 02 could be:

`ERDC8000A-102F1B.dgn/dwg`

where ERDC8000 is the Project Code, A- is the Discipline Designator, 1 is the Sheet Type Designator (Plan), 02 is the Sheet Sequence Number, and F1B is a user-definable set of characters for Floor 1, Quadrant B.

**Table 2-3**  
**Discipline Designators with Level 2 Designators**

Discipline	Designator	Description	Content
General	G-	All General	All or any portion of subjects in the following Level 2 Designators
	GI	General Informational	Drawing index, code summary, symbol legend, orientation maps
	GC	General Contractual	Phasing, schedules, contractor staging areas, fencing, haul routes, erosion control, temporary and special requirements
	GR	General Resource	Photographs, soil borings
Hazardous Materials	H-	All Hazardous Materials	All or any portion of subjects in the following Level 2 Designators
	HA	Asbestos	Asbestos abatement, identification, or containment
	HC	Chemicals	Toxic chemicals handling, removal or storage
	HL	Lead	Lead piping or paint removal
	HP	PCB	PCB containment and removal
	HR	Refrigerants	Ozone depleting refrigerants
Survey/Mapping	V-	All Survey/Mapping	All or any portion of subjects in the following Level 2 Designators
	VA	Aerial Survey	
	VF	Field Survey	
	VH*	Hydrographic Survey	
	VI	Digital Survey	
	VU	Combined Utilities	
Geotechnical	B-	All Geotechnical	All or any portion of subjects in the following Level 2 Designators
Civil	C-	All Civil	All or any portion of subjects in the following Level 2 Designators
	CB*	Civil Beach Renourishment	Beach Disposal and Renourishment
	CD	Civil Demolition	Structure removal and site clearing
	CE*	Civil Ecosystem Restoration	Environmental restoration
	CF*	Civil Flood Control	Levees, spillways, pump stations
	CG	Civil Grading	Excavation, grading, drainage, erosion control, retention ponds
	CI	Civil Improvements	Pavers, flagstone, exterior tile, furnishings, retaining walls, and water features
	CN*	Civil Navigation	Navigation, harbors, dredging
	CO*	Civil Operation and Maintenance	Repair and upgrade to O&M structures
	CP	Civil Paving	Roads, driveways, parking lots
	CH*	Civil Shore Protection	Erosion protection structures on shoreline
	CR*	Civil Recreation	Recreation facilities
	CS	Civil Site	Plats, topographic, dimension control
	CX*	Civil Security	Security-related work
	CT	Civil Transportation	Waterways, wharves, docks, trams, railways, airfields, and people movers
	CU	Civil Utilities	Water, sanitary sewer, storm sewer, power, communications, natural gas, and steam systems

\* = Not in NCS 3.1

(Continued)

**Table 2-3 (Continued)**

<b>Discipline</b>	<b>Designator</b>	<b>Description</b>	<b>Content</b>
Landscape	L-	All Landscape	All or any portion of subjects in the following Level 2 Designators
	LD	Landscape Demolition	Protection and removal of existing landscape
	LI	Landscape Irrigation	
	LP	Landscape Planting	
Structural	S-	All Structural	All or any portion of subjects in the following Level 2 Designators
	SD	Structural Demolition	Protection and removal
	SS	Structural Site	
	SB	Structural Substructure	Foundations, piers, slabs, and retaining walls
	SF	Structural Framing	Floors and roofs
Architectural	A-	All Architectural	All or any portion of subjects in the following Level 2 Designators
	AS	Architectural Site	
	AD	Architectural Demolition	Protection and removal
	AE	Architectural Elements	General architectural
	AI	Architectural Interiors	
	AF	Architectural Finishes	
	AG	Architectural Graphics	
Interiors	I-	All Interiors	All or any portion of subjects in the following Level 2 Designators
	ID	Interior Demolition	
	IN	Interior Design	
	IF	Interior Furnishings	
	IG	Interior Graphics	Murals and visuals
Equipment	Q-	All Equipment	All or any portion of subjects in the following Level 2 Designators
	QA	Athletic Equipment	Gymnasium, exercise, aquatic, and recreational
	QB	Bank Equipment	Vaults, teller units, ATMs, drive-through
	QC	Dry Cleaning Equipment	Washers, dryers, ironing, and dry cleaning
	QD	Detention Equipment	Prisons and jails
	QE	Educational Equipment	Chalkboards, library
	QF	Food Service Equipment	Kitchen, bar, service, storage, and processing
	QH	Hospital Equipment	Medical, exam, and treatment
	QL	Laboratory Equipment	Science labs, planetariums, observatories
	QM	Maintenance Equipment	Housekeeping, window washing, and vehicle servicing
	QP	Parking Lot Equipment	Gates, ticket, and card access
	QR	Retail Equipment	Display, vending, and cash register
	QS	Site Equipment	Bicycle racks, benches, playgrounds
	QT	Theatrical Equipment	Stage, movie, rigging systems
Fire Protection	QV	Video/Photographic Equipment	Television, darkroom, and studio
	QY	Security Equipment	Access control and monitoring, surveillance
	F-	All Fire Protection	All or any portion of subjects in the following Level 2 Designators
FA	FA	Fire Detection and Alarm	
	FX	Fire Suppression	Fire extinguishing systems and equipment

\* = Not in NCS 3.1

(Continued)

**Table 2-3 (Continued)**

<b>Discipline</b>	<b>Designator</b>	<b>Description</b>	<b>Content</b>
Plumbing	P-	All Plumbing	All or any portion of subjects in the following Level 2 Designators
	PS	Plumbing Site	Extensions and connections to Civil Utilities
	PD	Plumbing Demolition	Protection, termination, and removal
	PP	Plumbing Piping	Piping, valves, and insulation
	PQ	Plumbing Equipment	Pumps and tanks
	PL	Plumbing	Domestic water, sanitary and storm drainage, fixtures
Process	D-	All Process	All or any portion of subjects in the following Level 2 Designators
	DS	Process Site	Extension and connection to civil utilities
	DD	Process Demolition	Protection, termination, and removal
	DL	Process Liquids	Liquid process systems
	DG	Process Gases	Gaseous process systems
	DP	Process Piping	Piping, valves, insulation, tanks, pumps, etc.
	DQ	Process Equipment	Systems and equipment for thermal, electrical, materials handling, assembly and manufacturing, nuclear, power generation, chemical, refrigeration, and industrial processes
	DE	Process Electrical	Electrical exclusively associated with a process and not the facility
	DI	Process Instrumentation	Instrumentation, measurement, recorders, devices and controllers (electrical and mechanical)
Mechanical	M-	All Mechanical	All or any portion of subjects in the following Level 2 Designators
	MS	Mechanical Site	Utility tunnels and piping between facilities
	MD	Mechanical Demolition	Protection, termination, and removal
	MH	Mechanical HVAC	Ductwork, air devices, and equipment
	MP	Mechanical Piping	Chilled and heating water, steam
	MI	Mechanical Instrumentation	Instrumentation and controls
	MY*	Mechanical Hydraulic Systems	Pump stations, spillways, slide gates
Electrical	E-	All Electrical	All or any portion of subjects in the following Level 2 Designators
	EA*	Electrical Airfield Lighting and Navaids	Visual air navigation systems
	ES	Electrical Site	Exterior electrical systems (power, lighting, auxiliary)
	ED	Electrical Demolition	Protection, termination, and removal
	EP	Electrical Interior Power	Interior power
	EL	Electrical Interior Lighting	Interior lighting
	EI	Electrical Instrumentation	Controls, relays, instrumentation, and measurement devices
	EY	Electrical Interior Auxiliary Systems	Alarms, nurse call, security, CCTV, PA, music, clock, and program

\* = Not in NCS 3.1

(Continued)

**Table 2-3 (Concluded)**

<b>Discipline</b>	<b>Designator</b>	<b>Description</b>	<b>Content</b>
Telecommunications	T-	All Telecommunications	All or any portion of subjects in the following Level 2 Designators
	TD*	Telecommunications Demolition	Protection, termination, and removal
	TA	Audio Visual	Cable, music, and CCTV systems
	TC	Clock and Program	Time generators and bell program systems
	TI	Intercom	Intercom and public address systems
	TM	Monitoring	Monitoring and alarm systems
	TN	Data Networks	Network cabling and equipment
	TT	Telephone	Telephone systems, wiring, and equipment
	TY	Security	Access control and alarm systems
Resource	R-	All Resource	All or any portion of subjects in the following Level 2 Designators
	RC	Resource Civil	Surveyor's information and existing civil drawings
	RS	Resource Structural	Existing facility structural drawings
	RA	Resource Architectural	Existing facility architectural drawings
	RM	Resource Mechanical	Existing facility mechanical drawings
	RE	Resource Electrical	Existing facility electrical drawings
Other Disciplines	X		
Contractor/Shop Drawings	Z		
Operations	O		
* = Not in NCS 3.1			

**Table 2-4**  
**Sheet Type Designators**

<b>Sheet Type</b>	<b>Designator</b>
General (symbols legend, notes, etc.)	0
Plans (horizontal views)	1
Elevations (vertical views)	2
Sections (sectional views)	3
Large-Scale Views (plans, elevations, or sections that are not details)	4
Details	5
Schedules and Diagrams	6
User Defined	7
User Defined	8
3D Representations (isometrics, perspectives, photographs)	9

## Coordination Between Sheet File Name and Sheet Identifier

In assigning a sheet identifier (for use in the sheet identification block, reference bubbles, etc.), the user should coordinate with the name assigned to the electronic sheet file. The sheet identifier should consist of the discipline designator, sheet type designator, and the sheet sequence number (Figure 2-6).

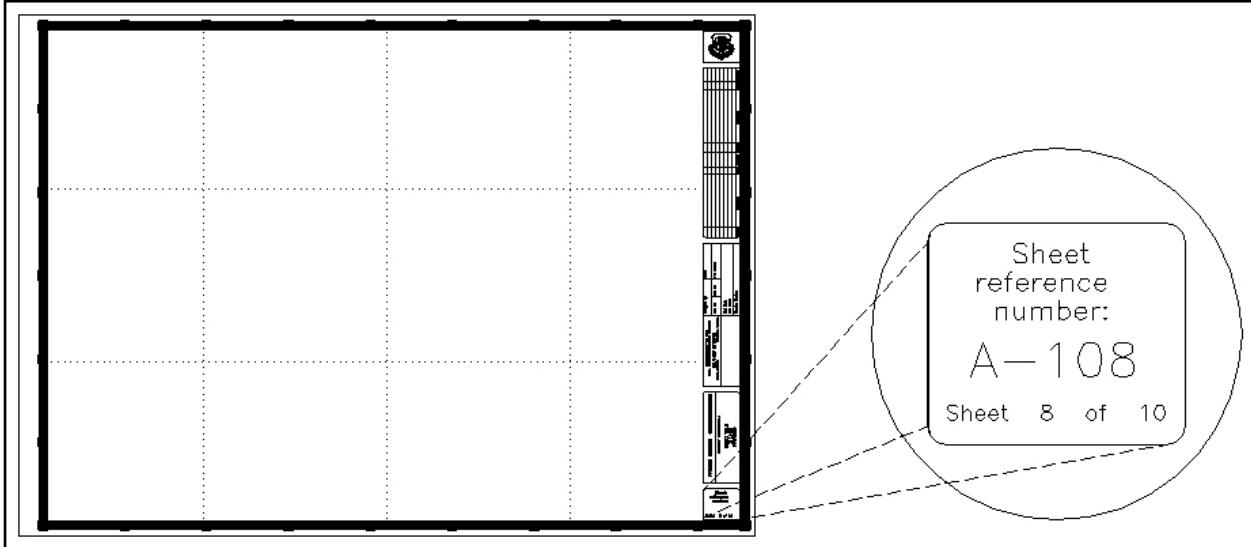


Figure 2-6. Typical border sheet title block with sheet identification block

As far as the sequence of the discipline designators in a drawing set, the National CAD Standard mandates that the disciplines follow the order as shown in Table 2-1.

# 3 Graphic Concepts

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## Presentation Graphics

The first step in establishing an effective CADD standard is the development of a uniform approach to presentation graphics. Presentation graphics typically consist of drawing elements such as lines, arcs, shapes, text, and their attributes (line color, line width, and line style). This chapter presents brief overviews of the characteristics of presentation graphics and the philosophy used to standardize them.

### Line widths

Although “monotone” line work is not contractually improper, varied line widths substantially improve readability. Most commercial CADD systems provide an extensive variety of line widths. However, for the majority of A/E/C drawings, the eight line widths defined in Table 3-1 are considered sufficient and should not be expanded unless an appreciable improvement in drawing clarity or contrast can be realized. Table 3-1 shows information about the various allowed line widths.

**Table 3-1**  
**Comparison of Line Widths**

Line Thickness	mm	in.	MicroStation Line Weight	Typical Use
Fine	0.18	0.007	wt = 0	Patterning
Thin	0.25	0.010	wt = 1	Dimension lines, dimension leader/witness lines, note leader lines, long break lines, schedule grid lines, and objects seen at a distance
Medium	0.35	0.014	wt = 2	Minor object lines
Wide	0.50	0.020	wt = 3	Major object lines, cut lines, section cutting plane lines, and titles
Extra Wide	0.70	0.028	wt = 5	Minor title underlining, match lines, schedule outlines, large titles, and object lines requiring special emphasis
XX Wide	1.00	0.040	wt = 7	Major title underlining and separating portions of drawings
XXX Wide	1.40	0.055	wt = 10	Border sheet outlines and cover sheet line work
XXXX Wide	2.00	0.079	wt = 15	Border sheet outlines and cover sheet line work

- Fine (0.18 mm). Fine lines should be used sparingly, mostly for hatching/patterning (this line thickness typically does not reproduce well in blue-line format and/or in photocopies).
- Thin (0.25 mm). Thin lines should be used for depicting dimension lines, dimension leader/witness lines, note leader lines, line terminators (arrowheads, dots, slashes), phantom lines, hidden lines, center lines, long break lines, schedule grid lines, and object lines seen at a distance.
- Medium (0.35 mm). Medium lines should be used for depicting most object lines, text (dimensions, notes/callouts, and schedule), and schedule grid accent lines.
- Wide (0.50 mm). Wide lines should be used for major object lines, cut lines, section cutting plane lines, and titles.
- Extra wide (0.70 mm). Extra-wide lines should be used for minor title underlining, schedule outlines, large titles, and object lines requiring special emphasis. For very large scale details drawn at 3 in. = 1 ft-0 in. or larger, the extra-wide width should be used for the object lines. Extra-wide widths are also appropriate for use as an elevation grade line, building footprint, or top of grade lines on section/foundation details.
- XX Wide (1.00 mm). This line weight should be used for major title underlining and separating portions of drawings.
- XXX Wide (1.40 mm). This line weight should be used for border sheet outlines and cover sheet line work.
- XXXX Wide (2.00 mm). This line weight should be used for border sheet outlines and cover sheet line work.

### **Line types/styles**

The predominant line types/styles used in this standard are listed in Table 3-2. The CGTC has created line style files for MicroStation and AutoCAD (called tsaec.rsc and tsaec.lin, respectively), which include the line styles in Table 3-2, as well as additional discipline custom line styles (see Appendix D). These files are available on the CGTC's Internet site at <https://tsc.wes.army.mil>.

**Table 3-2**  
**Standard Line Types/Styles**

ID	Description	MicroStation Designator	AutoCAD Designator	Example
0	Continuous	0	Continuous	—
1	Dotted	1	Dot	· · · · ·
2	Dashed	2	Hidden	- - - - -
3	Dashed spaced	3	Dashed	- - - - -
4	Dashed dotted	4	Dashdot	- - - - -
6	Dashed double-dotted	6	Divide2	- - - - -
7	Chain	7	Center	— — — — —

### Line color

The primary reason to use color in CADD drawings is to improve the clarity of the drawing on a computer monitor. The variety of colors available in a CADD application depends on the capabilities of the computer monitor and its video card. Today, most systems are capable of displaying up to 16.8 million colors. For consistency, this manual recommends that all A/E/C drawings be created using the basic colors presented in Table 3-3 whenever possible.

**Note:** *The recommended colors are best viewed on a monitor with a black background.*

Appendix C contains a 256-color map for the AutoCAD and MicroStation color palettes. The table maps AutoCAD's default color palette to MicroStation's default color palette. The color table is provided for those users who require more colors than the eight shown in Table 3-3.

**Table 3-3**  
**Screen Color Comparison**

Color	Color Number		Ratios of RGB		
	AutoCAD	MicroStation	Red	Green	Blue
Blue	5	1	0	0	255
Gray	8	9	128	128	128
Green	3	2	0	255	0
Red	1	3	255	0	0
Yellow	2	4	255	255	0
Magenta	6	5	255	0	255
Cyan	4	7	0	255	255
White	7	0	255	255	255

Note: Color numbers for AutoCAD and MicroStation were taken from default color tables.

## **Screening**

Screened images are created through a process in which the density and pattern of black and white dots are varied to simulate different shades of gray. Varying the intensity of gray scales allows users to distinguish different aspects of a drawing when it is plotted. For example, an area on a site designated for demolition can be assigned a color that has been assigned a screening percentage. When plotted, the area will be shown at a lighter shade compared with other elements in the drawing. This will allow the contractor to immediately identify the demolition area on the drawing.

Table 3-4 lists colors recommended to be used for screening along with a recommended screening percentage. Optionally, when variations in screening are not important, a single screening can be applied to all screened graphics.

**Table 3-4  
Screened Colors**

AutoCAD		MicroStation		Gray Scale Ratios (RGB)		
Color No.	Screen percent	Color No.	Screen percent	Red	Green	Blue
250	60	8	60	102	102	102
251	50	200	50	128	128	128
252	40	168	40	153	153	153
253	30	120	30	179	179	179
254	20	56	20	204	204	204

## **Text styles/fonts**

Each of the two major CADD platforms contains sets of fonts that have been designed for use in CADD drawing presentation. MicroStation has various fonts stored in font resource files, with each resource file capable of containing multiple fonts. AutoCAD has individual fonts as shape files. In addition, each platform has the ability to support True Type fonts that are installed on the individual computer. Although True Type fonts present a very useful alternative for fonts, there are drawbacks with their use. The most notable drawback is the longer time for rendering the drawing on the screen, and the longer time required for actual plotting. Each application also has the ability to create additional fonts for its use. Since projects designed in CADD are planned for use many years into the future and files will be used by many different individuals, use of any nonstandard font is not recommended. This includes fonts for symbology, logos, business titles, etc.

There is not a direct relationship between MicroStation resource files and AutoCAD shape files. Therefore it is important that font use be reviewed at the start of a project and decisions made on fonts that are then used consistently throughout the project by all disciplines. If a project is to be exchanged between CADD platforms either because individual offices require different CADD applications, or because the end user requires a specific software format, a general guideline would be to use True Type fonts. This would allow direct translations between the applications. If a project is to be designed in a single CADD application and there is no likelihood that there will be a need to translate it to a different CADD platform, then the native CADD application fonts should be used.

Contrasting text styles (or fonts) are used within a drawing to delineate types of information. In most A/E/C drawings, the fonts shown in Table 3-5 should be sufficient.

- Monotext font. This font creates text characters that are evenly spaced. Monotext font should be used where text fields need to be aligned such as in schedules or, in some cases, title blocks.
- Proportional font. This font creates text where the characters are proportionally spaced. It is appropriate for general notes, labels, or title blocks.
- Slanted font. A slanted font is used where text needs to be easily distinguished from other text.
- Filled font. Filled fonts are used primarily for titles and on cover sheets.
- Outline font. When a pen plotter is used for final output, the outline font is used as a substitute for filled fonts for major titles such as cover sheet information to save plotting time.
- Symbology font. This font should be used in cases where Greek symbols are representations for technical information.

**Table 3-5**  
**Comparison of Font Types**

Font Type	MicroStation	AutoCAD	True Type
Monotext	Font #3 ABCDEFGHIJKLMNPQRST UvwXYZ abcdefghijklmnopqrstuvwxyz UvwXYZ	monotxt ABCDEFGHIJKLMNPQRST UvwXYZ abcdefghijklmnopqrstuvwxyz UvwXYZ	Monospace 821 BT <b>ABCDEFGHIJKLMNPQRST</b> <b>UvwXYZ</b> <b>abcdefghijklmnopqrstuvwxyz</b> <b>UvwXYZ</b>
Proportional	Font #1 ABCDEFGHIJKLMNPQRST UvwXYZ abcdefghijklmnopqrstuvwxyz UvwXYZ	romans ABCDEFGHIJKLMNPQRST UvwXYZ abcdefghijklmnopqrstuvwxyz UvwXYZ	Arial <b>ABCDEFGHIJKLMNPQRST</b> <b>UvwXYZ</b> <b>abcdefghijklmnopqrstuvwxyz</b> <b>UvwXYZ</b>
Slanted	Font #23 ABCDEFGHIJKLMNPQRST UvwXYZ abcdefghijklmnopqrstuvwxyz UvwXYZ	romans (obliquing angle = 21.8) ABCDEFGHIJKLMNPQRST UvwXYZ abcdefghijklmnopqrstuvwxyz UvwXYZ	Arial (slanted by 21.8 degrees) <b>ABCDEFGHIJKLMNPQRST</b> <b>UvwXYZ</b> <b>abcdefghijklmnopqrstuvwxyz</b> <b>UvwXYZ</b>
Filled	Font #43 ABCDEFGHIJKLMNPQRST UvwXYZ abcdefghijklmnopqrstuvwxyz UvwXYZ	Swiss 721 BT <b>ABCDEFGHIJKLMNPQRST</b> <b>UvwXYZ</b> <b>abcdefghijklmnopqrstuvwxyz</b> <b>UvwXYZ</b>	Swiss 721 BT <b>ABCDEFGHIJKLMNPQRST</b> <b>UvwXYZ</b> <b>abcdefghijklmnopqrstuvwxyz</b> <b>UvwXYZ</b>
Outline	Font #42 ABCDEFGHIJKLMNPQRST UvwXYZ abcdefghijklmnopqrstuvwxyz UvwXYZ	Swiss 721 Black Outline BT <b>ABCDEFGHIJKLMNPQRST</b> <b>UvwXYZ</b> <b>abcdefghijklmnopqrstuvwxyz</b> <b>UvwXYZ</b>	Swiss 721 Black Outline BT <b>ABCDEFGHIJKLMNPQRST</b> <b>UvwXYZ</b> <b>abcdefghijklmnopqrstuvwxyz</b> <b>UvwXYZ</b>
Symbol	Font #26 ABXΔΕΦΓΗΙJKLΜΝΟΠΡΣΤ ΤΦΩΨΖ αβγδεφγηι?κλμνοπρστ νδωχψς	greekc ABXΔΕΦΓΗΙJKLΜΝΟΠΡΣΤ ΤΦΩΨΖ αβγδεφγηι?κλμνοπρστ νδωχψς	Symbol <b>ΑΒΧΔΕΦΓΗΙΚΛΜΝΟΠΡΣΤ</b> <b>ΥΦΩΨΖ</b> <b>αβγδεφγηι?κλμνοπρστ</b> <b>νδωχψς</b>

## **Abbreviations**

Abbreviations for words or phrases frequently used in plans, sections, elevations, or details should follow the abbreviations as established in the NCS (UDS Module 5 – Terms and Abbreviations). When possible, the use of abbreviations should be kept to a minimum. Other abbreviations, particularly discipline-unique abbreviations, may be used but must not conflict with those established in the NCS. The NCS Standard is available for purchase from the National Institute of Building Sciences at <http://www.nibs.org/ncsorderform.html>.

## **Plotting**

Printers and plotters are controlled by files called pen tables or feature tables. These files (tables) convert thicknesses and/or color in an electronic file to line thicknesses on a paper drawing.

This manual standardizes presentation graphics as they relate to electronic drawing files (screen display) and not the final printed or plotted paper drawing. By employing pen tables, each agency can ensure that consistent drawings are produced from an electronic file regardless of the type of printer or plotter used. It is the responsibility of each field activity to develop pen tables based on the printer/plotter used at that activity.

## **Border Sheets**

### **Sheet sizes**

Typical A/E/C projects (contract documents) will be prepared on American National Standards Institute (ANSI) D sheets (ANSI E may be used for large maps (i.e., installation master plans and drawings for civil works projects)). For international projects, International Organization for Standardization (ISO) A1 sheets are to be used (ISO A0 may be used for large maps). Other industry standard sizes may be used depending on specific customer requirements. Table 3-6 lists the standard sizes of all sheets.

**Table 3-6**  
**ISO, ANSI, and Architectural Sheet Size Comparison**

ISO Designation	Width		Length		ANSI Equivalent		Architectural Equivalent	
	mm	in.	mm	in.	Letter	in.	Letter	in.
NA	NA	NA	NA	NA	F	28.0 x 40.0	F	30.0 x 42.0
A0	841	33.11	1189	46.81	E	34.0 x 44.0	E	36.0 x 48.0
A1	594	23.39	841	33.11	D	22.0 x 34.0	D	24.0 x 36.0
A2	420	16.54	594	23.39	C	17.0 x 22.0	C	18.0 x 24.0
A3	297	11.69	420	16.54	B	11.0 x 17.0	B	12.0 x 18.0
A4	210	8.27	297	11.69	A	8.5 x 11.0	A	9.0 x 12.0

To develop the graphics for the sheet border, the following guidelines are to be used:

- Top and bottom margin: 3/4 inch (20 mm)
- Left margin: 1-1/2 inch (40 mm)
- Right margin: 3/4 inch (20 mm)

**Note:** *Users plotting A1 size drawings on ANSI D-size paper should reduce the width of the A1 border from 594 mm (23.39 in.) to 559 mm (22.0 in.). The length can remain the same. This revised border will fit on an ANSI D-size sheet (22 by 34 in.) and can be reproduced on standard office photocopiers.*

### Title block

The CGTC recommends the use of a vertical title block placed in the right-hand margin of the border sheet as shown in Figure 3-1. Use of the vertical title block provides the most usable drawing space on a sheet. The vertical title block also ensures that the most prevalent and pertinent information remains at the bottom right of the sheet. In compliance with the *Uniform Drawing System* (Construction Specifications Institute (CSI) 2004), title block data will include the following:

- Designer identification block
- Issue block
- Management block
- Project identification block/sheet title block
- Sheet identification block

**Note:** *Local standards may modify the content of the title block but should not alter its size or configuration if possible. See the Uniform Drawing System for additional recommendations.*

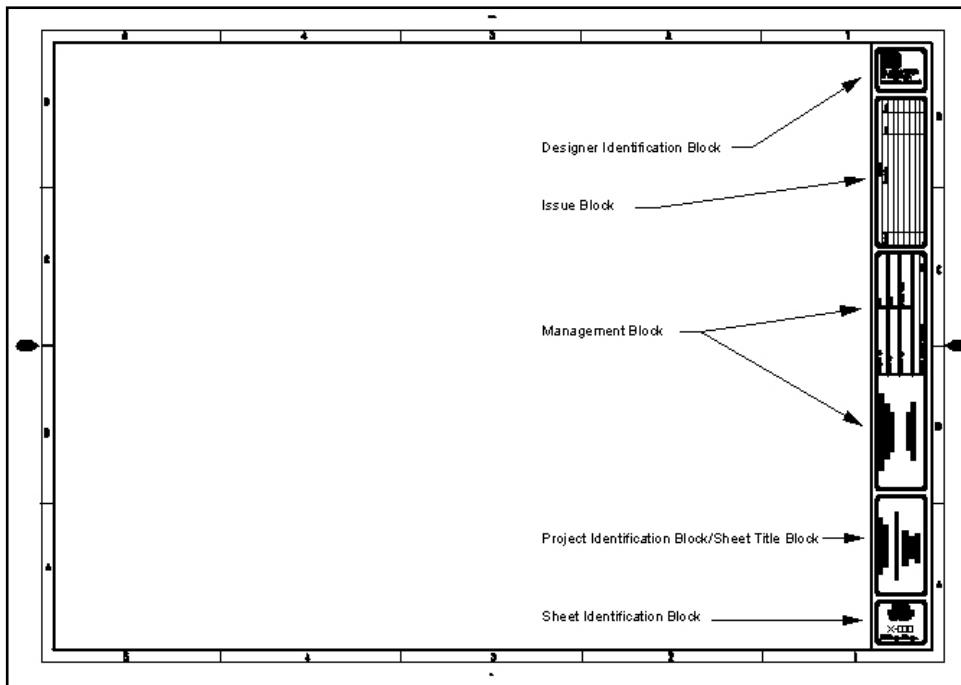


Figure 3-1. Vertical title block

**Designer identification block.** The designer identification block (Figure 3-2) contains the logo or name of the agency that designed the sheet. This space could also be expanded by reducing the size of the issue block to accommodate professional seals when required.

**Issue block.** The issue block (Figure 3-3) contains a history of revisions, addenda, and/or clarifications to the sheet. The first entry should be placed on the lower left-hand line of the issue block and subsequent entries should be made above it.

**Management block.** The management block (Figure 3-4) contains information about the designer, reviewer, and submitter. This block can also be used to maintain filing information about the drawing, such as the file name, plot scale, and drawing code (this information is sometimes plotted outside the drawing sheet cut line). If an A-E has developed the drawings, there is room for information about the firm in the lower left portion of the block.

The management block can also contain authorization block information. This is typically where the principals of the design agent would sign drawings, either for a whole project or by individual disciplines. Also, sometimes a disclaimer is included stating whether the project was designed by a Government agency or through a contract with a Government agency.

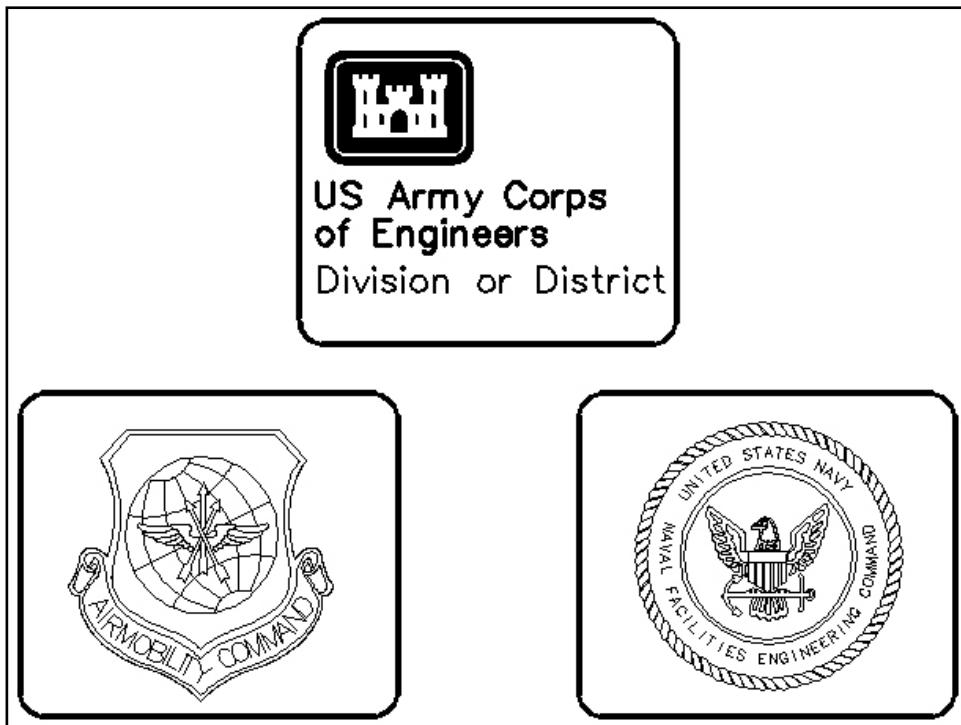


Figure 3-2. Designer identification block

Figure 3-3. Issue block

<p><b>U. S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS DISTRICT, STATE</b></p> <p><b>AE DESIGN FIRM COMPANY INFORMATION</b></p>	<p>Designed by:</p> <p>Drawn by:</p> <p>Checked by:</p>	<p>Date</p> <p>Scale:</p> <p>Drawing code:</p>
<p>Project Engineer/Architect:</p>		<p>Date:</p>

Figure 3-4. Management block

**Project identification block/sheet title block.** The project identification block/sheet title block (Figure 3-5) contains two sets of information. First, the project name is identified, possibly with the location or phase of the project identified. If small enough, a project logo can be presented in this block. The second set of information contains a description of the

content of the sheet (e.g., Architectural Floor Plan). If more than one type of information is presented on the sheet (i.e., plans, schedules, details), the most important information is identified.

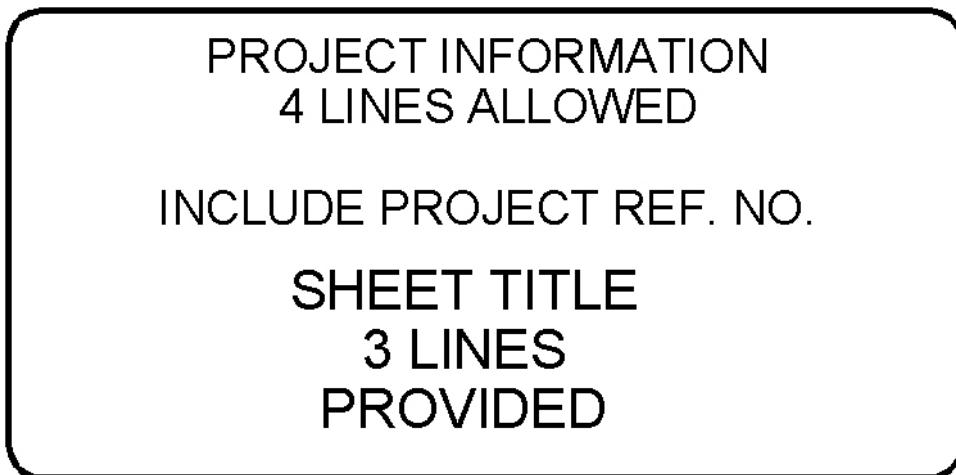


Figure 3-5. Project identification block/sheet title block

**Sheet identification block.** The sheet identification block (Figure 3-6) contains the sheet identifier. This sheet identifier is composed of the discipline designator, the sheet type designator, and the sheet sequence number described in the section, “Electronic Drawing File Naming Conventions” (Chapter 2). The “number of sheets” listing is optional and can contain either the total number of sheets for the entire project drawing set or the number of sheets for that particular discipline designator.

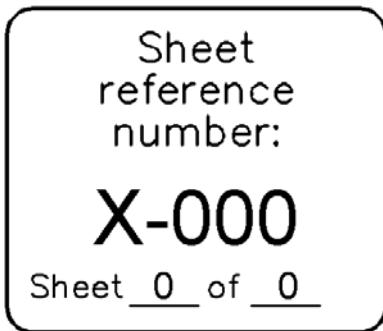


Figure 3-6. Sheet identification block

## Drawing Scales

Typical drawing scales for both SI and inch-pound measurements are indicated in Table 3-7.

The National CAD Standard (National Institute of Building Sciences (NIBS) 2005) recommends that the minimum text height for plotted CADD files is 3/32" (2.4 mm). However, to maintain legibility in half-size

drawings, most sites go no lower than 1/8" (3 mm) in text height. Table 3-8 lists recommended text sizes for common inch-pound scales, as well as line type scale factors for those scales. Table 3-9 lists recommended text sizes for common metric scales. (Note: The scales shown are not all-inclusive. Scales used should be limited to those commonly found on hand-held architectural, mechanical, and engineering scales.)

**Table 3-7**  
**Typical Drawing Scales**

Drawing Type	Metric	Inch-Pound
Site Plans	1:200	1" = 20'
	1:400	1" = 30'
	1:500	1" = 40'
	1:600	1" = 50'
	1:700	1" = 60'
	1:1000	1" = 100'
	1:2000	1" = 200'
	1:5000	1" = 400'
	1:6000	1" = 500'
	1:10000	1" = 1000'
Floor Plan	1:50	1/4" = 1' - 0"
	1:100	1/8" = 1' - 0"
	1:200	1/16" = 1' - 0"
Roof Plan	1:200	1/16" = 1' - 0"
Exterior elevations	1:100	1/8" = 1' - 0"
	1:200	1/16" = 1' - 0"
Interior Elevations	1:50	1/4" = 1' - 0"
	1:100	1/8" = 1' - 0"
Cross sections	1:50	1/4" = 1' - 0"
	1:100	1/8" = 1' - 0"
	1:200	1/16" = 1' - 0"
Wall sections	1:20	1/2" or 3/4" = 1' - 0"
Stair details	1:10	1" or 1-1/2" = 1' - 0"
Details	1:5	3" = 1' - 0"
	1:10	1" or 1-1/2" = 1' - 0"

**Table 3-8**  
**Inch-pound Text Sizes and Line Type Scales**

Scale	Text Size	Line Type Scale
12" = 1' - 0" or Full Size	0.125"	1
6" = 1'-0", 0.25", 2		
3" = 1' - 0"	0.50"	4
1-1/2" = 1' - 0"	1"	8
1" = 1' - 0"	1.5"	12
3/4" = 1' - 0"	2"	16
1/2" = 1' - 0"	3"	24
3/8" = 1' - 0"	4"	32
1/4" = 1' - 0"	6"	48
3/16" = 1' - 0"	8"	64
1/8" = 1' - 0"	12"	96
3/32" = 1' - 0"	16"	128
1/16" = 1' - 0"	24"	192
1/32" = 1' - 0"	48"	384
1" = 5'	7.5"	60
1" = 10'	1.25'	120
1" = 20'	2.5'	240
1" = 30'	3.75'	360
1" = 40'	5'	480
1" = 50'	6.25'	600
1" = 60'	7.5'	720
1" = 100'	12.5'	1200
1" = 200'	25'	2400
1" = 400'	50'	4800
1" = 500'	62.5'	6000
1" = 1000'	125'	12000
1" = 2000'	250'	24000

**Table 3-9**  
**Metric Text Sizes and Line Type Scales**

Scale	Text Size	Line Type Scale
1:1 or Full Size	3 mm	1
1:2.5	7.5 mm	2.5
1:5	15 mm	5
1:10	30 mm	10
1:20	60 mm	20
1:30	90 mm	30
1:40	120 mm	40
1:50	150 mm	50
1:60	180 mm	60
1:100	300 mm	100
1:200	600 mm	200
1:400	1.2 m	400
1:500	1.5 m	500
1:600	1.8 m	600
1:700	2.1 m	700
1:1000	3.0 m	1000
1:2000	6.0 m	2000
1:5000	15 m	5000
1:6000	18 m	6000
1:10000	30 m	10000
1:20000	60 m	20000

## Dimensioning

As far as the appearance of dimensions, the U.S. National CAD Standard (NCS) is very specific. Dimension text heights should match the size of the text in the rest of the drawing (i.e., notes and callouts) and the location of the dimension text should be at the midpoint and top of the dimension line (where possible). Dimension lines should be offset a minimum of 9/16" (14.5 mm) and extension lines should be offset a minimum of 1/16" (1.5 mm) from the element being dimensioned. Slashes are recommended by the NCS for dimension terminators; however, filled arrowheads are allowed in the A/E/C CADD Standard, as long as the arrowhead width is  $1.5 * TH$  ( $TH$  = dimension text height) and the height is  $0.5 * TH$ . This achieves the NCS requirement of 3:1 filled arrowheads. Dimension terminator selection should be consistent across the entire set of drawings.

## Dimensioning in Metric (SI)

Methodologies for dimensioning metric (SI) drawings are based upon the recommendations of the Construction Metrication Council of NIBS, Washington, DC. These recommendations comply with the American Society for Testing and Materials (ASTM) E 621-94 (ASTM 1999).

### Millimeters

The preferred unit of measure for most A/E/C work is millimeters. Unit notations are unnecessary and should not be used. The dimension is provided as a whole number as shown in Figure 3-7. Also, a note should be added to the drawing stating, “All dimensions and/or dimensions shown in callouts/notes are in millimeters unless otherwise noted.”

When meter measurements are included on the same sheet, the meter dimension is provided as a real number taken to three places past the decimal point (Figure 3-8). Again, unit notations are unnecessary.

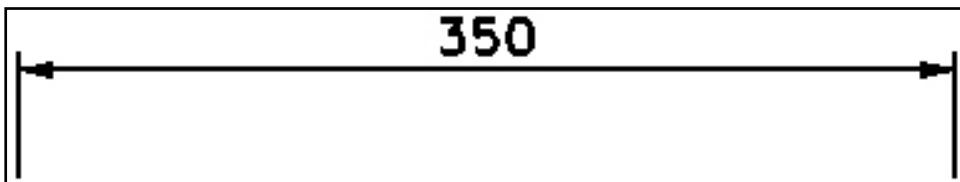


Figure 3-7. Dimension in millimeters. Always shown as a whole number

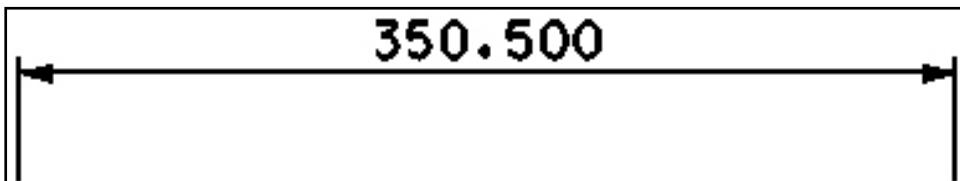


Figure 3-8. Dimension in meters. Always shown as a real number (with decimal)

**Note:** *In circumstances where very small dimensions are used (e.g., machine details), it is permissible to use real numbers for millimeter dimensions. A note should be placed on the detail regarding this fact.*

### Meters

For site plans or other drawings drawn to scales over 1:200, the unit of measure is typically meters. Where greater accuracy is required, show dimensions to three decimal places (Figure 3-8). A note should be added to the drawing stating, “All dimensions and/or dimensions shown in callouts/notes are in meters unless otherwise noted.”

## Large units of measure

Commas shall not be used when providing large units of measure; instead, a space replaces the traditional comma in numbers containing five or more digits (e.g., the number 45,000 is displayed as 45 000). In numbers containing four digits, no space is necessary (e.g., 5000). These methods are shown in Figures 3-9 and 3-10.

**Note:** *The automatic dimensioning features of AutoCAD do not allow users to replace commas with spaces in dimension text. The dimension text will presently have to be edited to provide the spacing required by ASTM E 621-94 (ASTM 1999).*

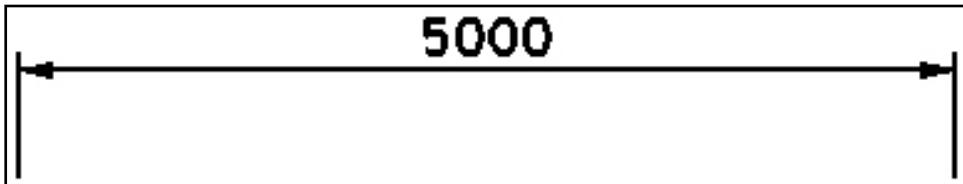


Figure 3-9. Proper dimension presentations for metric measurements with four or fewer digits

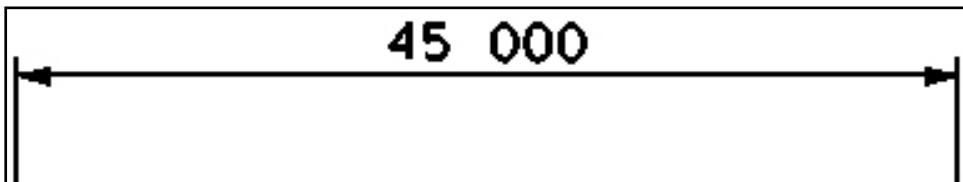


Figure 3-10. Proper dimension presentations for metric measurements with five or more digits

## Dual units

To avoid confusion, dual units (both inch-pound and metric) should not be used. As stated in Construction Metrication Council (1998), the use of dual units “increases dimensioning time, doubles the chance for errors, makes drawings more confusing, and only postpones the (metric) learning process.”

Exceptions to this include certain “standard building designs” where dual dimensions ensure that the design can be used in either SI or inch-pound projects and in situations where products/components used in an SI project are available only as inch-pound products.

# 4 Level/Layer Assignments

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## Levels/Layers

CADD levels or layers are analogous to overlays in manual drafting systems and serve to separate graphic elements (lines, shapes, and text) according to the design discipline they represent (Figure 4-1).

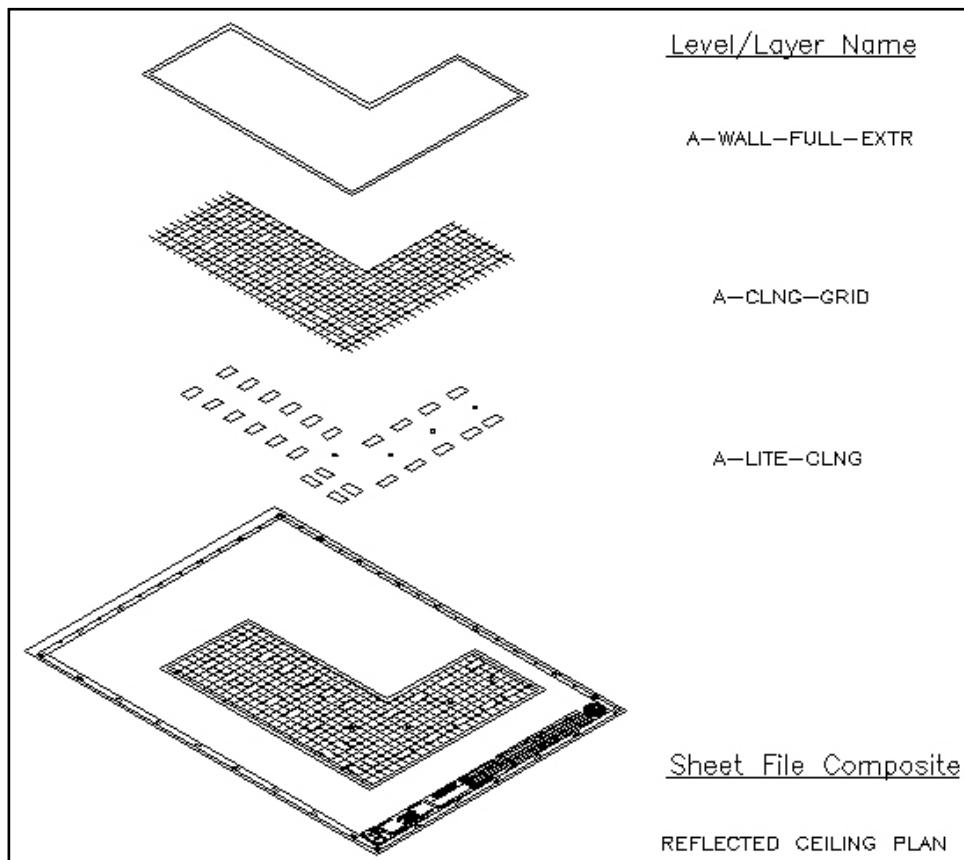


Figure 4-1. Typical levels/layers contained in a sheet file

The types of information represented by individual levels/layers can be grouped into two primary types: model-file-specific information and sheet-file-specific information (Figure 4-2). Sheet-file-specific

information can then be broken down into two secondary types: design-model-specific and sheet-model-specific.

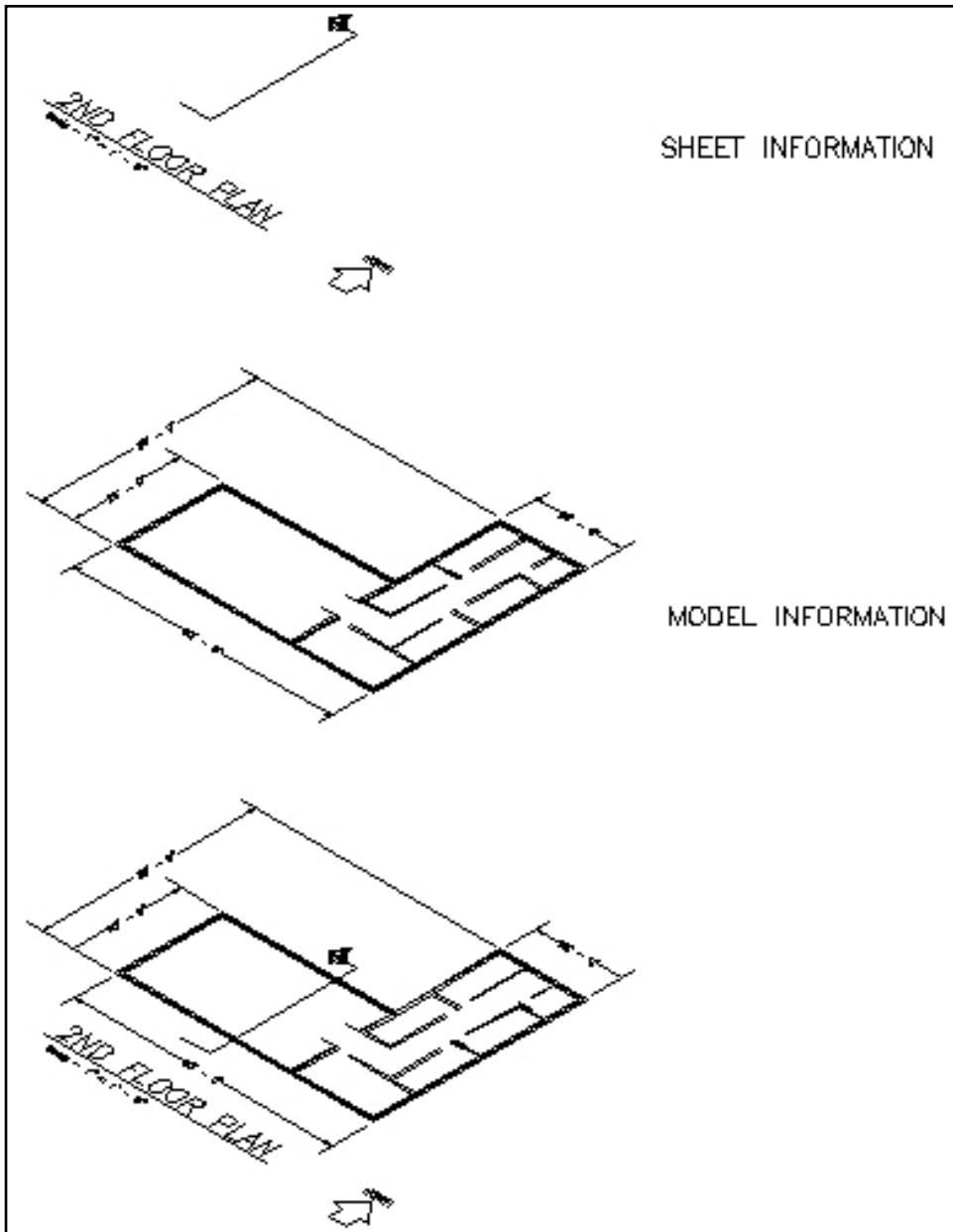


Figure 4-2. Sheet- and model-specific information

- Model-file-specific information represents the physical form of a site, a building, or objects composing a building. This information is often shared between CADD files (both model file and sheet file) through the use of reference files. Examples include walls, doors, light fixtures, and room numbers. Model-file-specific information may be either literal (e.g., walls) or symbolic (e.g., electrical outlets).

- Sheet-file-specific information may include notes, annotative symbols, and titles. This type of information is usually not shared between CADD files or drawings. Design models inside a sheet file contain graphic information that would relate to real-world information (e.g., point coordinates), or information that would be sectioned off into multiple sheets (e.g., a floor plan that may take three sheets to present because of its size). Sheet-model-specific information would include items specific for the presentation of that sheet. This is one reason that sheet models should never be used as a reference file to other files.

A third type of information exists for BIM. The files created in BIM are different from model files and sheet files because they are not directly referenced as graphics in the generation of drawings. Information from BIM is extracted and used to create the traditional models used in CADD generation of drawings.

To use and manipulate model-file- and sheet-file-specific information effectively, every level/layer must be defined (standardized) by its name and its use.

### **Level/layer naming convention**

The reuse, not duplication, of graphic information reduces drawing time and improves project coordination. The level/layer is the basic tool used in CADD for managing graphic information (Figure 4-3). The levels/layers defined within this standard are based on the recommendations set forth in “AIA CAD Layer Guidelines” (AIA 2005).

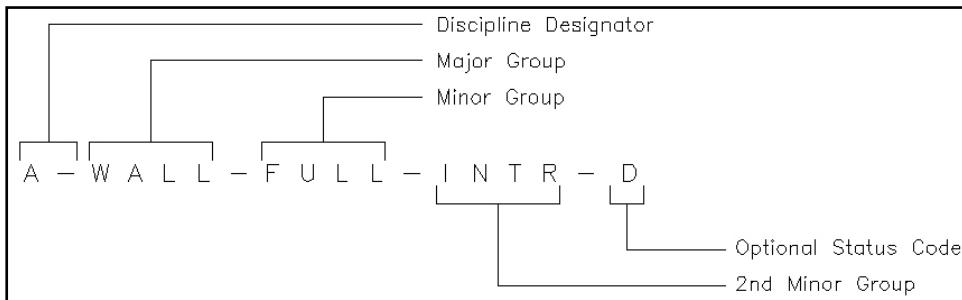


Figure 4-3. Level/layer naming format

A basic level/layer name consists of a two-character Discipline Designator (e.g., “A-“ for Architectural, “M-“ for Mechanical), a four-character Major Group (e.g., “DOOR” for Doors, “LITE” for Lighting Fixtures), and a four-character Minor Group (e.g., A-WALL-CNTR for wall center lines, M-HVAC-CDFF for HVAC ceiling diffusers). For further differentiation, another four-character Minor Group may be used (e.g., A-WALL-

FULL-EXTR for exterior full-height walls versus A-WALL-FULL-INTR for interior full-height walls). An optional item to indicate Status or Phase can also be added to every level/layer name (See “Status (Phase) levels/layers” later in this chapter).

### ISO format

ISO 13567-2 (ISO 1998) presents an international method for level/layer naming (Figure 4-4). This method consists of 10 mandatory alphanumeric characters, followed by 10 optional alphanumeric characters. The first two-character field, Agent Responsible, correlates to the AIA’s Discipline Designator. The following six-character field, Element, can map to a shortened version of the AIA’s Major and Minor Groups (e.g., DOOR-FULL becomes DOORFU, DOOR-PRHT becomes DOORPR). The final two-character field in the mandatory level/layer name, Presentation, designates whether the level/layer information is Model information (i.e., model-specific information) or Page/Paper information (i.e., sheet-specific information). Appendix A gives a corresponding ISO Format level/layer name for each AIA Format level/layer name.

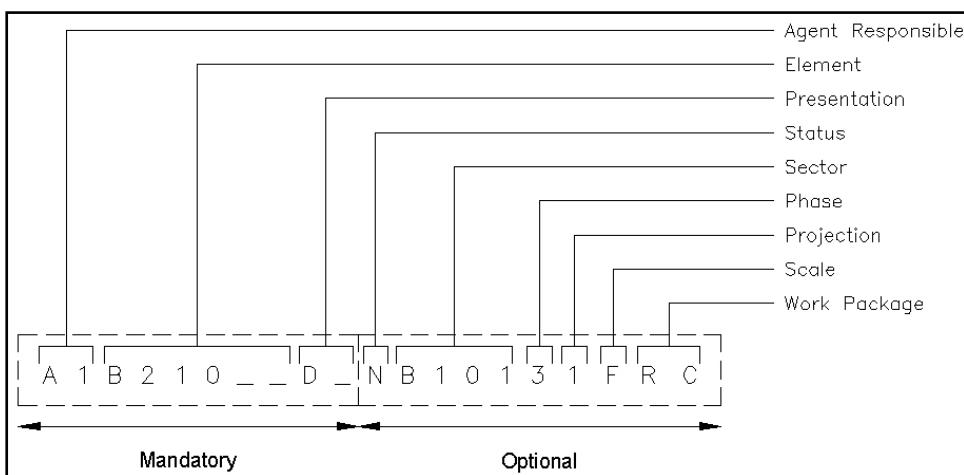


Figure 4-4. ISO 13567-2 level/layer naming method

## Model Files

As mentioned in Chapter 2, model files represent full-size drawings of building elements, systems, or information (e.g., the mechanical HVAC system, the architectural floor plan, details, or sections), and sheet files represent final plotted sheets. Model files are used as components in creating plotted sheet files. The information contained within a model file for a discipline may be referenced by other disciplines to create the particular model files or sheet files for that discipline.

A model file can be considered a work in progress. For instance, a mechanical engineer may reference the architect's floor plan model file to begin development of the HVAC ductwork layout model file. Meanwhile, the architect can continue developing the floor plan to meet new requirements. Any changes to the floor plan would be immediately accessible to the mechanical engineer. The viewing of real-time updates eliminates a great deal of frustration for other disciplines because it allows for on-the-spot rather than after-the-fact modifications.

### **Level/layer assignment tables**

The level/layer assignment tables in Appendix A present the following (Figure 4-5 presents an excerpt):

- The levels/layers assigned to each model file.
- An AIA and corresponding ISO format level/layer name for each level/layer.
- A detailed description for each level/layer.
- The recommended presentation graphics associated with each level/layer. This includes the line style, line width, and color.  
(Note: The recommended presentation graphics may be changed to aid in drawing clarity (e.g., to show hidden objects). However, the recommended presentation graphics should be adhered to as much as possible to maintain drawing consistency.)
- The various model files that levels/layers can be created in.

**Annotation levels/layers.** The function of annotation levels/layers is to contain model-specific information that might not be required by other disciplines. These levels/layers are as follows with \*\* representing a Discipline Designator (e.g., A-, C-):

**\*\*ANNO-DIMS**

Witness/extension lines, dimension terminators, and dimension text.

**\*\*ANNO-KEYN**

Reference keynotes with associated leaders.

**\*\*ANNO-NOTE**

General notes and remarks.

**\*\*ANNO-NPLT**

Non-plotting graphic information.

**\*\*ANNO-PATT**

Patterning, poche, shading, and hatching.

**\*\*ANNO-SYMB**

Miscellaneous symbols.

**\*\*ANNO-TEXT**

Miscellaneous text and callouts with associated leaders.

**\*\*ANNO-RDME**

Read-me information.

**\*\*ANNO-REFR**

An AutoCAD user-specific layer for use in attachment of external references (i.e., reference files).

Discipline: Architectural			Model File Types			
Model File Layers/Levels			Graphic Defaults			
AIA Format	ISO Format	Level/Layer Description	Line Style	Line Width (mm)	AutoCAD Color #	MicroStation Color #
<b>General Information</b>						
A-ANNO-DIMS	A----DIP-	Witness/extension lines, dimension terminators, dimension text	0	V	V	V
A-ANNO-KEYN	A----KEP-	Reference keynotes with associated leaders	0	V	V	V
A-ANNO-NOTE	A----NOP-	General notes and general remarks	0	0.35	2	4
A-ANNO-NPLT	A----NPP-	Non-plotted graphic information	0	0.18	5	1
A-ANNO-PATT	A----PAP-	Patterning, poche, shading, and hatching	V	0.18	8	9
A-ANNO-RDME	A----RDP-	Read-me information	0	0.18	5	1
A-ANNO-REFR	A----RFP-	Reference files (AutoCAD users only)	NA	NA	NA	NA
A-ANNO-SYMB	A----SYP-	Miscellaneous symbols	V	V	6	5
A-ANNO-TEXT	A----TEP-	Miscellaneous text and callouts with associated leaders	0	V	V	V
<b>Area Information</b>						
A-AREA-IDEN	A-AREADM-	Room numbers, tenant identifications, area calculations	0	0.35	2	4
A-AREA-LINE	A-AREALIM-	Architectural area calculation boundary lines	0	0.50	4	7
A-AREA-OCCP	A-AREAOCM-	Occupant or employee names	0	0.35	2	4
A-AREA-PATT	A-AREAPAM-	Area cross hatching	0	0.18	8	9

Figure 4-5. Model file level/layer assignment table

**Status (Phase) levels/layers.** In some cases, levels/layers may be modified to show the status of a particular item in the drawing (e.g., to be demolished, to be moved, future work, etc.). In these cases, levels/layers may have a Status Field appended to them as shown in Figure 4-3. See Table 4-1 for the Status (Phase) codes.

**Table 4-1**  
**Status (Phase) Codes**

Code	Description
N	New work
E	Existing to remain
D	Existing to demolish
F	Future work
T	Temporary work
M	Items to be moved
X	Not in contract
1-9	Phase numbers

The use of the Status (Phase) code should be limited, since it can significantly increase the number of levels/layers in a model file. Most items can be shown through referenced model files or changing the line style of items. For instance, New Work can be shown in the current model file; Existing to Remain items can be shown through a screened reference file. Not in Contract items and Future Items could be shown with a dashed line style. Therefore, it is up to the user to determine whether the use of the Status (Phase) code in level/layer names increases the readability of the model file.

### **Border sheet model files**

As mentioned before, a model file contains information that can be referenced by other disciplines to create other model files or final sheet files. Border sheets are referenced by all disciplines to create sheet files; therefore border sheets are model files. A border sheet model file contains border sheet linework, the title block, and project-specific symbols and text. Typically, each discipline will use the same border sheet and fill in sheet-specific information within the title block or revision block prior to printing the final sheet file (e.g., sheet number, designer names).

### **Reference files (XREFs)**

Reference files (external references or XREFs) enable designers to share drawing information electronically, eliminating the need to exchange hard copy drawings between the design disciplines. With the use of reference files, the structural engineer need not wait for the architect to complete the architectural floor plans before beginning the structural framing plan model file.

Referencing electronic drawing information makes any changes later made by the architect apparent to the structural designer. This real-time

access to the work of others ensures accuracy and consistency within a set of drawings and helps promote concurrent design efforts. No longer does one discipline have to wait until another discipline is nearly finished before they begin their drawings.

However, the use of level/layer assignments is a key component in the successful use of reference files. Proper use of levels/layers allows others to use the information in various model files efficiently by allowing levels/layers to be turned on only for the desired graphics.

## Sheet Files

Sheet files are the final project sheets that are ready to be plotted. A sheet file contains sheet-specific information (e.g., north arrows, scales, section cuts, title block information) in a sheet model (i.e., Paper Space for AutoCAD users). A design model inside the sheet files contains the model information assembled as it would be displayed on a sheet. This model would have real-world spatial alignment and would be used as the primary model for graphical information to be displayed and presented in the sheet model. (See Chapter 2 for more on drawing assembly.)

### Level/layer assignment tables

The level/layer assignment tables in Appendix B present the following (Figure 4-6):

- The levels/layers assigned to each sheet file.
- An AIA and corresponding ISO format level/layer name for each level/layer.
- A detailed definition for each level/layer.
- The recommended presentation graphics associated with each level/layer. This includes the line style, line width, and color.

Users should note that the first 13 level/layers of the sheet file type for every discipline are the same, with the exception that the Discipline Designator changes depending on the discipline for that sheet file type. The unique function of these Annotation levels/layers is to contain sheet-specific information. These levels/layers are as follows with \*\* representing a Discipline Designator (e.g., A-, C-):

#### \*\*ANNO-DIMS

Sheet-specific witness/extension lines, dimension terminators, and dimension text.

Discipline: Architectural							
Level/Layer Naming					Graphic Defaults		
AIA Format	ISO Format	Level/Layer Description		Line Style	Line Width (mm)	AutoCAD Color #	MicroStation Color #
<b>General Information</b>							
A-ANNO-DIMS	A----DIP-	Sheet-specific dimensions (includes witness/extension lines, dimension terminators, dimension		0	V	V	V
A-ANNO-KEYN	A----KEP-	Sheet-specific reference keynotes with associated leaders		0	V	V	V
A-ANNO-LEGN	A----LEP-	Legends and symbol keys		0	V	V	V
A-ANNO-NOTE	A----NOP-	Sheet-specific notes and general remarks		0	0.35	2	4
A-ANNO-NPLT	A----NPP-	Non-plotting graphic information		0	0.18	5	1
A-ANNO-PATT	A----PAP-	Sheet-specific patterning and hatching (e.g., keyplan patterning)		0	0.18	8	9
A-ANNO-RDME	A----RDP-	Read-me information		0	0.18	5	1
A-ANNO-REDL	A----REP-	Redlines		0	0.25	1	3
A-ANNO-REFR	A----RFP-	Reference files (AutoCAD users only)		NA	NA	NA	NA
A-ANNO-REVS	A----RVP-	Revisions		0	0.50	4	7
A-ANNO-SCHD	A----SCP-	Schedules		0	V	V	V
A-ANNO-SYMB	A----SYP-	Sheet-specific symbols (e.g., scales, north arrow, section cuts, detail bubbles, etc.)		V	0.35	6	5
A-ANNO-TEXT	A----TEP-	Sheet-specific text and callouts with associated leaders (e.g., title block text, legend and schedule		0	V	V	V

Figure 4-6. Sheet file level/layer assignment table

#### \*\*ANNO-KEYN

Sheet-specific keynotes with associated leaders.

#### \*\*ANNO-LEGN

Legends and symbol keys.

#### \*\*ANNO-NOTE

Sheet-specific notes and general remarks.

#### \*\*ANNO-NPLT

Non-plotting graphic information.

#### \*\*ANNO-PATT

Sheet-specific patterning and hatching (e.g., keyplan patterning).

#### \*\*ANNO-RDME

Read-me information.

#### \*\*ANNO-REDL

Redlines.

#### \*\*ANNO-REVS

Revisions, amendments, addenda, and modifications.

#### \*\*ANNO-SCHD

Schedules.

#### \*\*ANNO-SYMB

Sheet-specific symbols (e.g., north arrow, scales).

**\*\*ANNO-TEXT**

Sheet-specific text and callouts with associated leaders.

**\*\*ANNO-REFR**

An AutoCAD user-specific layer for use in attachment of external references (i.e., reference files).

### **Development of sheet files**

As mentioned previously, referenced model files are used in the construction of sheet files. The user opens the sheet file type from Appendix B that is appropriate to his/her discipline, then references existing model files into a design model. This design model is used to generate the sheet model for that file. At this point, information can be placed on the annotation layers for the model that has been assembled.

For example, after the designer assembles the model files and creates the sheet model as described previously in Chapter 2, the designer would have to “turn off” levels/layers within each referenced model file to achieve the desired sheet file. Which method of drawing assembly is to be used determines how additional annotations are placed. In the design model/sheet model option, design-model-specific annotations can be placed in the design model. When a border sheet and the design model are referenced together to form the sheet model, the designer could then place sheet-specific annotations in the sheet model. When the single model approach is taken, the border sheet is referenced along with the design model (separate design file) into a sheet model and annotations are then placed in the sheet model. The sheet file levels/ layers such as P-ANNO-TEXT would be used to fill in sheet-specific information (e.g., sheet number, designer name). Once the final sheet file is achieved, the resulting file is saved (with all reference files attached).

# 5 Standard Symbology

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## Introduction

A “cell” in MicroStation and a “block” in AutoCAD are groups of graphical elements that can be manipulated as a single entity. Examples of typical cells/blocks are windows, doors, graphic scale keys, furniture, etc. The use of such symbology enhances CADD productivity and provides an excellent opportunity for CADD standardization.

## Electronic Version of the Symbology/Elements

### Deliverables

Within the electronic deliverables available as part of the A/E/C CADD Standard, the following symbology is provided:

- MicroStation cells contained in cell libraries (.cel) and custom line styles contained in resource files (.rsc).

**Note:** *Even though the symbols are provided in cell libraries, for MicroStation V8 each symbol is an individual .dgn file. The .cel files are groupings of those .dgn files.*

- AutoCAD blocks, each in an individual drawing (.dwg) file, patterns in a pattern library file (.pat), multilines in a multiline library file (.mln), and custom line styles in a line type library file (.lin).

### Line styles

Line style definitions determine the particular dash-dot sequence and relative length of dashes, blank spaces, and the characteristics of any included text or shapes. Working with line styles provides a means of distinguishing the purpose of one line from another.

AutoCAD and MicroStation both provide a set of standard line styles, as well as allowing the user to define custom line styles. In AutoCAD these custom line styles are defined in a line type library file (.lin) and a multiline library file (.mln). In MicroStation, custom line styles are contained in resource files (.rsc) (see Chapter 3, “Line types/styles” for more information).

**Note:** *Custom line styles do not readily translate between systems; therefore users should anticipate that translated custom line styles may revert into their primitive graphics.*

## Tabulated Version of the Symbology/Elements

Graphical presentations of the entire symbology library are shown in Appendix D, “A/E/C CADD Symbology.”

The symbology library contains four types of elements: Lines, Patterns, Symbols, and Objects. Lines are defined as a graphical representation of linear drawing features (e.g., utility lines, fence lines, contours). Patterns are defined as repeated drawing elements (e.g., lines, dots, circles) within a defined area. Symbols are defined as MicroStation cells or AutoCAD blocks that are representative of objects (e.g., electrical outlets, smoke detectors). Objects are defined as MicroStation cells or AutoCAD blocks that retain their actual size no matter the scale of the drawing (e.g., 30- by 50-in. desk, 3'-0" door).

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# **Appendix A**

## **Model File Level/Layer Assignment Tables**

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This appendix provides the model file level/layer assignment tables:

General.....	A3
Hazardous Materials .....	A4
Survey/Mapping.....	A6
Geotechnical .....	A19
Civil .....	A22
Landscape .....	A32
Structural.....	A33
Architectural .....	A39
Interiors .....	A42
Fire Protection.....	A44
Plumbing .....	A46
Mechanical.....	A48
Electrical .....	A54
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**Discipline: General**  
**Model File Layers/Levels**

Level/layer Naming		ISO Format		Level/Layer Description		Graphic Defaults		Model File Types	
AIA Format	Level/layer Naming	ISO Format	Level/Layer Description	Line Style	Line Width (mm)	AutoCAD Color #	MicroStation Color #	Border Sheet	Key Plan
<b>General Information</b>									
G-ANNO-KEYN	G----KEP-		Reference keynotes with associated leaders		0	V	V	V	V
G-ANNO-MASK	G----MAP-		Text/shape mask for use with photo backgrounds		0	0.18	113	16	X
G-ANNO-MATC	G----MTP-		Match lines		0	0.35	6	5	X
G-ANNO-NOTE	G----NOP-		General notes and general remarks		0	0.35	2	4	X
G-ANNO-NPLT	G----NPP-		Non-printing graphic information		0	0.18	5	1	X
G-ANNO-PATT	G----PAP-		Patterning, poche, shading, and hatching		V	0.18	8	9	X
G-ANNO-RDME	G----RDP-		Read-me information		0	0.18	5	1	X
G-ANNO-REFR	G----REFP-		Reference files (AutoCAD users only)		NA	NA	NA	NA	X
G-ANNO-SYMB	G----SYP-		Miscellaneous symbols		V	0.35	6	5	X
G-ANNO-TEXT	G----TEP-		Miscellaneous text		0	V	V	V	X
G-ANNO-TTLB	G----TIP-		Border and tileblock linework		V	V	V	V	X
G-ANNO-TLB-GRID	G----TGP-		Grid lines inside border		7	0.18	5	1	X
<b>Grid Lines</b>									
G-GRID-COOR	G-GRIDCOM-		X-Y coordinate grid lines		0	0.25	7	0	X
G-GRID-COOR-DEN	G-GRIDCOOR-		X-Y coordinate grid lines annotation		0	0.25	7	0	X
G-GRID-EXTR	G-GRDEXM-		Column grid outside building		7	0.18	5	1	X
G-GRID-DEN	G-GRIDDIM-		Column grid tags		0	0.25	1	3	X
<b>Floor Information</b>									
G-PLAN-OTLN	G-PLANOTM-		Floor outline/permeter/building footprint		0	0.35	6	5	X
<b>Coordinate Information</b>									
G-PROJ-LALO-COOR	G-PROJLCM-		Latitude/longitude coordinate grid ticks		0	0.25	2	4	X
G-PROJ-LALO-DEN	G-PROJLDM-		Latitude/longitude coordinate text		0	0.25	2	4	X
G-PROJ-STAT-COOR	G-PROJSCM-		State plane coordinate grid ticks		3	0.25	2	4	X
G-PROJ-STAT-DEN	G-PROJSIM-		State plane coordinate text		0	0.25	2	4	X
<b>Site Information</b>									
G-SITE-OTLN	G-SITEOTM-		Site plan - key map		0	0.35	6	5	X

Note: V = Varies, NA = Not Applicable

**Discipline: Hazardous Materials  
Model File Layers/Levels**

Level/Layer Naming		ISO Format		Level/Layer Description		Graphic Details		Model File Types	
AIA Format		General Information		Decontamination		Sectoids		Pollution Prevention Plan	
		H-ANN0-DIMS	H----DIP-	Witness/extension lines, dimension terminators, dimension text	0	V	V	X	X
		H-ANN0-KEYN	H----KEP-	Reference keynotes with associated leader:	0	V	V	X	X
		H-ANN0-NOTE	H----NOP-	General notes and general remarks	0	0.35	2	4	X
		H-ANN0-NPLT	H----NPP-	Non-printing graphic information	0	0.18	5	1	X
		H-ANN0-PATT	H----PAP-	Patterned, poche, shading, and hatching	V	0.18	8	9	X
		H-ANN0-RDME	H----RDP-	Read-me information	0	0.18	5	1	X
		H-ANN0-REFR	H----RFP-	Reference files (AutoCAD users only)	NA	NA	NA	NA	X
		H-ANN0-SYMB	H----SYP-	Miscellaneous symbols	V	V	6	5	X
		H-ANN0-TEXT	H----TEP-	Miscellaneous text and callouts with associated leader:	0	V	V	X	X
Buildings		H-BLDG-IDEN	H-BLDGIDM-	Annotation	0	0.35	2	4	X
		H-BLDG-OTLN	H-BLDGOTM-	Command posts, information centers	0	0.35	2	4	X
Disposal Areas		H-DECNEQPM	H-DECNEQM-	Decontamination equipment	0	0.25	1	3	X
		H-DECN-IDEN	H-DECNIDM-	Annotation	0	0.35	6	5	X
Emergency Fixtures		H-DISPHZMW	H-DISPHZWM-	Hazardous waste	0	0.18	5	1	X
		H-DISP1-IDEN	H-DISP1DM-	Annotation	0	0.35	6	5	X
		H-DISP2-MUNIT	H-DISP2DM-	Munitions	0	0.18	5	1	X
		H-DISP2-TANK	H-DISP2TANM-	Spill containment tanks	0	0.35	6	5	X
Monitoring Stations		H-FIXT-EVW	H-FIXTEM-	Emergency eyewashes	0	0.25	3	2	X
		H-FIXT-SWR	H-FIXTSHM-	Emergency showers	0	0.25	3	2	X
Pollution Areas		H-MNST-AIRQ	H-MNSTAINM-	Air quality	0	0.25	3	2	X
		H-MNST-GWTR	H-MNSTGWM-	Ground water	0	0.25	3	2	X
		H-MNST-IDEN	H-MNSTIDM-	Annotation	0	0.25	3	2	X
		H-MNST-LAND	H-MNSTLANDM-	Landfill sites	0	0.25	3	2	X
		H-MNST-SOIL	H-MNSTSOM-	Soil gases	0	0.25	3	2	X
		H-MNST-SWTR	H-MNSTSWM-	Surface water	0	0.25	3	2	X
Sample Points		H-POLL-CONC	H-POLLCOM-	Polluted area of concern	0	0.35	2	4	X
		H-POLL-IDEN	H-POLLIDM-	Annotation	0	0.35	2	4	X
		H-POLL-ORIG	H-POLLORM-	Point of pollution origin	0	0.35	2	4	X
		H-POLL-POTN	H-POLLPOWM-	Potential spill/ emission, or release source	0	0.35	2	4	X

**Discipline: Hazardous Materials**  
**Model File Layers/Levels**

Level/Layer Naming		AIA Format		ISO Format		Level/Layer Description		Graphic Defaults		Model File Types	
<b>Storage Facilities</b>		H-STOR-HAZM	H-STORHMM-	Hazardous materials				0	0.35	6	5
		H-STOR-HAZW	H-STORHWM-	Hazardous waste				0	0.35	6	5
		H-STOR-IDEN	H-STORIDM-	Annotational				0	0.35	6	5
<b>Sections</b>		H-SECT-IDEN	H-SECTIDM-	Component identification numbers				0	0.35	2	4
		H-SECT-MBND	H-SECTMBM-	Material beyond section cut				0	0.18	5	1
		H-SECT-MCUT	H-SECTMCUT-	Material cut by section				0	0.50	4	7
		H-SECT-PATT	H-SECTPAM-	Textures and hatch patterns				0	0.18	8	9
<b>Detail Information</b>		H-DETL-GRPH	H-DETLGRM-	Graphics, gridlines, non-text items				V	V	V	X
		H-DETL-INPD	H-DETLINP-	Inch-pound specific dimensions and notes				0	V	V	X
		H-DETL-METR	H-DETLMEM-	Metric specific dimensions and notes				0	V	V	X

Note: V = Varies, NA = Not Applicable

**Discipline: Survey/Mapping**  
Model File Layers/Levels

Level/Layer Naming		ISO Format		Level/Layer Description		Graphic Details		Model File Types	
General Information								Existing Profiles	
V-ANNO-DIMS	V----DIP-			Witness/extension lines, dimension terminators, dimension text		0	V	V	V
V-ANNO-KEYN	V----KEP-			Reference keynotes with associated leader		0	V	V	V
V-ANNO-MASK	V----MAP-			Text/shape mask for use with photo backgrounds		0	0.18	113	16
V-ANNO-NOTE	V----NDF-			General notes and general remarks		0	0.35	2	4
V-ANNO-NPP	V----NPP-			Non-printing graphic information		0	0.18	5	1
V-ANNO-NPLT	V----PAP-			Pattern, poche, shading, and hatching		V	0.18	8	9
V-ANNO-RDMF	V----RDP-			Read-me information		0	0.18	5	1
V-ANNO-REFR	V----RFP-			Reference files (AutoCAD users only)		NA	NA	NA	NA
V-ANNO-SYMB	V----SYV-			Reference symbols		V	V	V	V
V-ANNO-TEXT	V----TEP-			Miscellaneous text and callouts with associated leader		0	V	V	V
Aerial Survey									
V-AERI-BNDY	V-AERIBNM-			Aerial photography boundaries		0	0.35	6	5
V-AERI-BNDY-NEAT	V-AERIBNM-			Neat model boundary		0	0.35	2	4
V-AERI-FLYS	V-AERIFLM-			Fly station		0	0.35	6	5
V-AERI-IDEN	V-AERIIDNM-			Aerial annotation		0	0.35	2	4
V-AERI-INDX	V-AERIRNM-			Aerial photo index		0	0.70	7	0
V-AERI-PATH	V-AERIPAM-			Aerial flight lines/patterns		11	0.35	22	22
V-AERI-PHOT	V-AERIPHOT-			Photo center (exposure station)		0	0.35	22	22
V-AERI-PNPT	V-AERIPNM-			Panel points		0	0.35	6	5
Airfields									
V-AFLD-BBCNS-IDEN	V-AFLDBBM-			Identifier tags, symbol modifiers, and text		0	0.25	203	45
V-AFLD-BBCNS-MISC	V-AFLDBMM-			Miscellaneous navairds - windcones and beacons		0	0.35	203	45
V-AFLD-BBCNS-STRB	V-AFLDBSM-			Strobe beacons		0	0.35	203	45
V-AFLD-CIRC-CTRL	V-AFLDCCM-			Control and monitoring circuits		0	0.35	163	41
V-AFLD-CIRC-IDEN	V-AFLDCIM-			Circuit identifier tags, symbol modifier, and text		0	0.25	2	4
V-AFLD-CIRC-MULT	V-AFLDCSM-			Multiple circuits		0	0.35	23	46
V-AFLD-CIRC-SERS	V-AFLDCSM-			Series circuits		0	0.35	203	45
V-AFLD-DEVC	V-AFLDDEM-			Capacitors, voltage regulators, motors, buses, generators, meters, grounds, and markers		0	0.35	23	46
V-AFLD-DUCT	V-AFLDDUM-			Ductbanks		EUDCX	0.25	83	42
V-AFLD-IDEN	V-AFLDIDM-			Airfield annotation		0	0.35	2	4
V-AFLD-JBOX	V-AFLDJBM-			Junction boxes, pull boxes, manholes, handholes, pedestals, splice:		0	0.35	23	46
V-AFLD-LITE-APPR	V-AFLDLAM-			Approach lights		0	0.35	203	45
V-AFLD-LITE-DIST	V-AFLDDLM-			Distance and arresting gear markers		0	0.35	203	45
V-AFLD-LITE-DANE	V-AFLDLAM-			Hoveline, taxilane, and helipad lights		0	0.35	203	45
V-AFLD-LITE-OBST	V-AFLDLOM-			Obstruction lights		0	0.35	203	45
V-AFLD-LITE-RUNW	V-AFLDRRM-			Runway lights		0	0.35	203	45
V-AFLD-LITE-SIGN	V-AFLDTSM-			Taxiway guidance signs		0	0.35	203	45
V-AFLD-LITE-TAXI	V-AFLDTTM-			Taxiway lights		0	0.35	203	45
V-AFLD-LITE-THRS	V-AFLDLHM-			Threshold lights		0	0.35	203	45
V-AFLD-VALT	V-AFLDVAM-			Airfield lighting vaults		0	0.35	203	45
Alignments									
V-ALGN-DATA	V-ALGNDAFM-			Alignment coordinates and curve data		0	0.25	3	2
V-ALGN-LINE	V-ALGNLIM-			Alignments		4	0.25	2	4
V-ALGN-MAJR	V-ALGNMAM-			Alignment major stationing and tick marks		0	0.25	1	3
V-ALGN-MARK	V-ALGNMAM-			Alignment tick marks		0	0.25	3	2

**Discipline: Survey/Mapping**  
Model File Layers/Levels

Layer/layer Naming		ISO Format		Level/layer Description		Graphic Details		Model File Types	
		V-ALIGN-MINR	V-ALIGNM-MINR	Alignment minor stationing and tick marks		Line Style	Line Width (mm)	MicroStation Color #	AutoCAD Color #
		V-ALIGN-STAT	V-ALIGNM-STAT	Alignment stationing			0.18	6	3
		V-ALIGN-SYMB	V-ALIGNM-SYMB	Alignment symbols (PIs)			0.25	3	4
		V-ALIGN-TEXT	V-ALIGNM-TEXT	Alignment text; annotation with associated reader			0.25	6	5
<b>Aprons</b>		V-APRN-CNTR	V-APRNCTM-M	Apron centerlines		Line Style	Line Width (mm)	MicroStation Color #	AutoCAD Color #
V-APRN-CNTR-DEN		V-APRNCTM-M	V-APRNCTM-M	Apron centerline annotator			0	0.18	6
V-APRN-GRND		V-APRNGRDM-M	V-APRNGRDM-M	Grounding points			0	0.25	2
V-APRN-HOLD		V-APRNHOM-M	V-APRNHOM-M	Holding position markings			0	0.25	2
V-APRN-IDEN		V-APRNIDM-M	V-APRNIDM-M	Airfield apron - annotator			0	0.18	1
V-APRN-MOOR		V-APRNMMRM-M	V-APRNMMRM-M	Mooring points			0	0.25	2
V-APRN-MRKG		V-APRNMRKG-M	V-APRNMRKG-M	Apron markings			0	0.35	4
V-APRN-OTLN		V-APRNOTLM-M	V-APRNOTLM-M	Airfield apron - outlines			0	0.35	7
V-APRN-SECU		V-APRNSECUM-M	V-APRNSECUM-M	Security zone markings			0	0.18	1
V-APRN-SHLD		V-APRNSHLDMRKG	V-APRNISM-M	Shoulders with annotator			0	0.25	2
V-APRN-SHLD-MRKG		V-APRNISM-M	V-APRNISM-M	Shoulder stripes			0	0.25	4
<b>Beach Renourishment</b>		V-BECH-BANK-TOP-	V-BECHBTM-M	Beach top of bank		Line Style	Line Width (mm)	MicroStation Color #	AutoCAD Color #
V-BECH-BKLN		V-BECHBKTM-M	V-BECHBKTM-M	Beach breakline			0	0.18	6
V-BECH-BNCH		V-BECHBNM-M	V-BECHBNM-M	Beach bench			2	0.25	5
V-BECH-CNTR		V-BECHCNM-M	V-BECHCNM-M	Beach centerline			6	0.25	22
V-BECH-LIMT		V-BECHLIMT-M	V-BECHLIMT-M	Beach limit lines			7	0.18	5
V-BECH-OHWM		V-BECHOHWM-M	V-BECHOHWM-M	Ordinary high water marks			0	0.35	4
V-BECH-OTLN		V-BECHOTLM-M	V-BECHOTLM-M	Beach outline			0	0.25	2
V-BECH-SLOP-DEN		V-BECHSLOP-M	V-BECHSLOP-M	Beach slope indicator with annotator			0	0.18	7
V-BECH-SLOP-TOP-		V-BECHSTM-M	V-BECHSTM-M	Beach top of slope			2	0.25	22
V-BECH-SYMB		V-BECHSYM-M	V-BECHSYM-M	Beach symbols			0	0.18	6
V-BECH-TOE-		V-BECHTOM-M	V-BECHTOM-M	Beach toe			3	0.35	5
V-BECH-TOE--IDEN		V-BECHTOM-M	V-BECHTOM-M	Beach toe annotator			0	0.18	7
<b>Buildings and Primary Structures</b>		V-BLDG-DECK	V-BLDGDEM-M	Outdoor decks (attached, no roof overhead)		Line Style	Line Width (mm)	MicroStation Color #	AutoCAD Color #
V-BLDG-DOCK		V-BLDGDOM-M	V-BLDGDOM-M	Loading docks			0	0.35	4
V-BLDG-IDEN		V-BLDGIDM-M	V-BLDGIDM-M	Building and other structure annotation			0	0.35	7
V-BLDG-OTLN		V-BLDGOTLM-M	V-BLDGOTLM-M	Building and other structure outlines			0	0.25	2
V-BLDG-OVHD		V-BLDGOVHM-M	V-BLDGOVHM-M	Building overhangs			0	0.50	7
V-BLDG-PRCH		V-BLDGPFRM-M	V-BLDGPFRM-M	Porches (attached, roof overhead)			0	0.35	4
<b>Borings</b>		V-BORE-GEN-1-LOCN	V-BOREGM-M	General boring X,Y location marker		Line Style	Line Width (mm)	MicroStation Color #	AutoCAD Color #
V-BORE-GEN-NAME		V-BOREGM-M	V-BOREGM-M	General boring name			0	0.35	6
V-BORE-GEN-NOTE		V-BOREGM-M	V-BOREGM-M	General boring notes			0	0.35	6
V-BORE-GPRO-LOCN		V-BOREGM-M	V-BOREGM-M	GeoProbe X,Y location marker			0	0.35	6
V-BORE-GPRO-NOME		V-BOREGM-M	V-BOREGM-M	GeoProbe boring name			0	0.35	6
V-BORE-GPRO-NOTE		V-BOREGM-M	V-BOREGM-M	GeoProbe boring notes			0	0.35	6
V-BORE-UNDS-LOCN		V-BOREUNM-M	V-BOREUNM-M	Undisturbed boring X,Y location marker			0	0.35	6
V-BORE-UNDS-NAME		V-BOREUNM-M	V-BOREUNM-M	Undisturbed boring name			0	0.35	6
V-BORE-UNDS-NOTE		V-BOREUNM-M	V-BOREUNM-M	Undisturbed boring notes			0	0.35	6
V-BORE-VCOR-LOCN		V-BOREVM-M	V-BOREVM-M	Vibra-Core X,Y location marker			0	0.35	6

**Discipline: Survey/Mapping**  
Model File Layers/Levels

Layer/layer Naming		ISO Format		Level/layer Description		Graphic Details		Model File Types	
V-BORE-VBOR-NAME	V-BOREVN-M-	V-BOREVN-M-	V-BOREVN-M-	Vibra-Core name	Vibra-Core notes	Line Style	Line Width (mm)	AutoCAD Color #	Microsoft Color #
V-BORE-VBOR-NOTE	V-BOREVM-	V-BOREVM-	V-BOREVM-				0.35	6	5
<b>Borrow Areas</b>							0.35	6	5
V-BORWIDEN	V-BORWIDM-	V-BORWIDM-	V-BORWIDM-	Borrow/soil area annotation	Borrow/spoil area	Line Style	Line Width (mm)	AutoCAD Color #	Microsoft Color #
V-BORW-LINE	V-BORWLM-	V-BORWLM-	V-BORWLM-				0.25	2	4
<b>Bridges</b>									
V-BRDG-CHRD-LOW~	V-BRDGCLM-	V-BRDGCLM-	V-BRDGCLM-	Low chord	Bridge centerlines	Line Style	Line Width (mm)	AutoCAD Color #	Microsoft Color #
V-BRDG-CNTR	V-BRDGCM-	V-BRDGCM-	V-BRDGCM-	Bridge centerlines	Bridge joints	Line Style	Line Width (mm)	AutoCAD Color #	Microsoft Color #
V-BRDG-CTLJ	V-BRDGCTM-	V-BRDGCTM-	V-BRDGCTM-	Bridge deck	Bridge annotation	Line Style	Line Width (mm)	AutoCAD Color #	Microsoft Color #
V-BRDG-DECK	V-BRDGDEM-	V-BRDGDEM-	V-BRDGDEM-	Bridge outline	Bridge railing	Line Style	Line Width (mm)	AutoCAD Color #	Microsoft Color #
V-BRDG-IDEN	V-BRDGIDM-	V-BRDGIDM-	V-BRDGIDM-	Bridge outlines	Bridge railing	Line Style	Line Width (mm)	AutoCAD Color #	Microsoft Color #
V-BRDG-OTLN	V-BRDGOTM-	V-BRDGOTM-	V-BRDGOTM-	Bridge outlines	Bridge railing	Line Style	Line Width (mm)	AutoCAD Color #	Microsoft Color #
V-BRDG-RAIL	V-BRDGRAM-	V-BRDGRAM-	V-BRDGRAM-	Bridge railing	Bridge railing	Line Style	Line Width (mm)	AutoCAD Color #	Microsoft Color #
<b>Cathodic Protection System</b>									
V-CATH-ANOD	V-CATHANM-	V-CATHANM-	V-CATHANM-	Sacrificial anode system	Identifier tags, symbol modifier, and text	Line Style	Line Width (mm)	AutoCAD Color #	Microsoft Color #
V-CATH-CURR	V-CATHCUM-	V-CATHCUM-	V-CATHCUM-	Impress current system	Test stations	Line Style	Line Width (mm)	AutoCAD Color #	Microsoft Color #
V-CATH-IDEN	V-CATHIDM-	V-CATHIDM-	V-CATHIDM-	Identifier tags, symbol modifier, and text	Test stations	Line Style	Line Width (mm)	AutoCAD Color #	Microsoft Color #
V-CATH-TEST	V-CATHTEM-	V-CATHTEM-	V-CATHTEM-			Line Style	Line Width (mm)	AutoCAD Color #	Microsoft Color #
<b>Channels</b>									
V-CHAN-BANK-IDEN	V-CHANBIM-	V-CHANBIM-	V-CHANBIM-	Channel/canal top of bank annotation	Channel/canal top of bank annotation	Line Style	Line Width (mm)	AutoCAD Color #	Microsoft Color #
V-CHAN-BANK-TOP~	V-CHANBTM-	V-CHANBTM-	V-CHANBTM-	Channel/canal top of bank	Channel/canal bench design feature lines (breaklines from DTMs	Line Style	Line Width (mm)	AutoCAD Color #	Microsoft Color #
V-CHAN-BNCH	V-CHANBNM-	V-CHANBNM-	V-CHANBNM-	Breakwaters	Channel centerline and survey report lines	Line Style	Line Width (mm)	AutoCAD Color #	Microsoft Color #
V-CHAN-BWTR	V-CHANBWTR	V-CHANBWTR	V-CHANBWTR	Breakwaters	Channel centerline and survey report lines - annotation	Line Style	Line Width (mm)	AutoCAD Color #	Microsoft Color #
V-CHAN-CNTR	V-CHANCNTR-	V-CHANCNTR-	V-CHANCNTR-	Channel centerline and survey report lines - annotation	De-authorized channel limits, anchorages, etc.	Line Style	Line Width (mm)	AutoCAD Color #	Microsoft Color #
V-CHAN-CNTR-IDEN	V-CHANCNTRIDEN	V-CHANCNTRIDEN	V-CHANCNTRIDEN	Channel centerline and survey report lines - annotation	De-authorized channel limits, anchorages, etc. - annotation	Line Style	Line Width (mm)	AutoCAD Color #	Microsoft Color #
V-CHAN-DACL	V-CHANDAM-	V-CHANDAM-	V-CHANDAM-	De-authorized channel limits, anchorages, etc. - annotation	Docks, decks, floats, piers, and mooring facilities	Line Style	Line Width (mm)	AutoCAD Color #	Microsoft Color #
V-CHAN-DACL-IDEN	V-CHANDAMIDEN	V-CHANDAMIDEN	V-CHANDAMIDEN	De-authorized channel limits, anchorages, etc. - annotation	Channel limits, anchorages, turning basins, disposal areas, etc	Line Style	Line Width (mm)	AutoCAD Color #	Microsoft Color #
V-CHAN-DOCK	V-CHANDOCK	V-CHANDOCK	V-CHANDOCK	Docks, decks, floats, piers, and mooring facilities	Channel limits, anchorages, turning basins, disposal areas, etc	Line Style	Line Width (mm)	AutoCAD Color #	Microsoft Color #
V-CHAN-LIMIT	V-CHANLIM-	V-CHANLIM-	V-CHANLIM-	Channel limits, anchorages, turning basins, disposal areas, etc	Navigation aids and text	Line Style	Line Width (mm)	AutoCAD Color #	Microsoft Color #
V-CHAN-LIMT-IDEN	V-CHANLIMDEN	V-CHANLIMDEN	V-CHANLIMDEN	Navigation aids and text	Channel cut/fill slope (indicates cut and fill lines)	Line Style	Line Width (mm)	AutoCAD Color #	Microsoft Color #
V-CHAN-NAID	V-CHANNAIM-	V-CHANNAIM-	V-CHANNAIM-	Navigation aids and text	Spoil limits	Line Style	Line Width (mm)	AutoCAD Color #	Microsoft Color #
V-CHAN-SLOP-LINE	V-CHANSLPIM-	V-CHANSLPIM-	V-CHANSLPIM-	Navigation aids and text	Channel/canal symbols	Line Style	Line Width (mm)	AutoCAD Color #	Microsoft Color #
V-CHAN-SPOL	V-CHANSPOL	V-CHANSPOL	V-CHANSPOL	Navigation aids and text	Channel/canal toe annotation with associated leader	Line Style	Line Width (mm)	AutoCAD Color #	Microsoft Color #
V-CHAN-SYMB	V-CHANSYMB	V-CHANSYMB	V-CHANSYMB	Navigation aids and text	Channel/canal toe	Line Style	Line Width (mm)	AutoCAD Color #	Microsoft Color #
V-CHAN-TEXT	V-CHANTEXT	V-CHANTEXT	V-CHANTEXT	Navigation aids and text	Channel/canal toe annotation	Line Style	Line Width (mm)	AutoCAD Color #	Microsoft Color #
V-CHAN-TOE~	V-CHANTOEM-	V-CHANTOEM-	V-CHANTOEM-	Navigation aids and text	Channel/canal toe	Line Style	Line Width (mm)	AutoCAD Color #	Microsoft Color #
V-CHAN-TOE--IDEN	V-CHANTOIDM-	V-CHANTOIDM-	V-CHANTOIDM-	Navigation aids and text	Turning points	Line Style	Line Width (mm)	AutoCAD Color #	Microsoft Color #
V-CHAN-TURN	V-CHANTURN	V-CHANTURN	V-CHANTURN	Navigation aids and text	Channel/canal wide	Line Style	Line Width (mm)	AutoCAD Color #	Microsoft Color #
<b>Communications</b>									
V-COMM-EQFM	V-COMMEQM-	V-COMMEQM-	V-COMMEQM-	Other communications distribution equipment	Communication junction boxes, pull boxes, manholes, pedestals, and splices	Line Style	Line Width (mm)	AutoCAD Color #	Microsoft Color #
V-COMM-JBOX	V-COMMJBM-	V-COMMJBM-	V-COMMJBM-	Communication junction boxes, pull boxes, manholes, pedestals, and splices	Overhead communications/telephone lines	Line Style	Line Width (mm)	AutoCAD Color #	Microsoft Color #
V-COMM-OVHD	V-COMMOVHM-	V-COMMOVHM-	V-COMMOVHM-	Overhead communications/telephone lines	Identifier tags, symbol modifier and text	Line Style	Line Width (mm)	AutoCAD Color #	Microsoft Color #
V-COMM-OVHD-IDEN	V-COMMOVHIDEN	V-COMMOVHIDEN	V-COMMOVHIDEN	Overhead communications/telephone lines	Poles	Line Style	Line Width (mm)	AutoCAD Color #	Microsoft Color #
V-COMM-POLE	V-COMMPOLM-	V-COMMPOLM-	V-COMMPOLM-	Overhead communications/telephone lines	Guying equipment	Line Style	Line Width (mm)	AutoCAD Color #	Microsoft Color #
V-COMM-POLE-GUYS	V-COMMPOLGYS	V-COMMPOLGYS	V-COMMPOLGYS	Overhead communications/telephone lines		Line Style	Line Width (mm)	AutoCAD Color #	Microsoft Color #

**Discipline: Survey/Mapping**  
Model File Layers/Levels

Layer/layer Naming		ISO Format		Level/layer Description		Graphic Details		Model File Types	
V-COMM-POLE-IDEN	V-COMMPOLI-M-	V-COMMPOLI-M-	Identifier tags, symbol modifiers, and text	0	0.25	203	45	Existing X-Sections	
V-COMM-UNDR-IDEN	V-COMMU-NDR-	V-COMMU-NDR-	Underground communications/telephone lines	COMUGX	0.35	4	7	Existing Profiles	
V-COMM-UNDR-IDEN	V-COMMU-NDR-	V-COMMU-NDR-	Identifier tags, symbol modifier and text	0	0.25	4	7	Existing Aerial Lighting Plan	
<b>Control Points</b>		V-CTRL-BMRK	V-CTRLBMM-M-	Benchmarks	0	0.35	6	5	
		V-CTRL-GRID	V-CTRLGRM-M-	Grid	0	0.25	3	2	
		V-CTRL-HCPT	V-CTRLHCM-M-	Horizontal control points	0	0.35	6	5	
		V-CTRL-HVPT	V-CTRLHVM-M-	Horizontal/vertical control points	0	0.35	6	5	
		V-CTRL-IDEN	V-CTRLIDM-M-	Control point annotation	0	0.35	2	4	
		V-CTRL-TRAV	V-CTRLTRM-M-	Traverse points	0	0.35	6	5	
		V-CTRL-Vcpt	V-CTRLVCM-M-	Vertical control points	0	0.35	6	5	
<b>Domestic Water</b>		V-DOMW-ABND-PIPE	V-DOMWAPM-M-	Abandoned piping	2	0.25	6	5	
		V-DOMW-DEV-C	V-DOMWDEM-M-	Connectors, faucets, reducers, regulators, vents, intake points, taps, backflow preventers, and valves	0	0.25	6	5	
		V-DOMW-FIRE	V-DOMWFIM-M-	Fire lines	FIRE	0.25	1	3	
		V-DOMW-FITG	V-DOMWFTM-M-	Caps, cleatnouts, crosses, and tees	0	0.25	6	5	
		V-DOMW-HYDR	V-DOMWHYM-M-	Hydrants	0	0.25	1	3	
		V-DOMW-IDEN	V-DOMWIDM-M-	Identifier tags, symbol modifier, and text	0	0.25	2	4	
		V-DOMW-MAIN-PIPE	V-DOMWMPPM-M-	Main domestic water piping	WATRX	0.25	6	5	
		V-DOMW-METR	V-DOMWMETM-M-	Meters	0	0.25	3	2	
		V-DOMW-NPOT-HYDR	V-DOMWNPHYM-M-	Non-potable hydrants/flushing hydrants	0	0.25	1	3	
		V-DOMW-NPOT-PIPE	V-DOMWNPPM-M-	Non-potable water piping	NONPOT	0.25	6	5	
		V-DOMW-PITS-IDEN	V-DOMWPITM-M-	Identifier tags, symbol modifier, and text	0	0.25	3	2	
		V-DOMW-PITS-VENT	V-DOMWPITM-M-	Vent pits	0	0.25	3	2	
		V-DOMW-PITS-VLVE	V-DOMWPITM-M-	Valve pits/vaults	0	0.25	3	2	
		V-DOMW-SERV-PIPE	V-DOMWSVPM-M-	Domestic water service piping	0	0.25	6	5	
		V-DOMW-SIGN	V-DOMWSGM-M-	Surface markers/signs	0	0.25	1	3	
		V-DOMW-STNS-IDEN	V-DOMWSTNM-M-	Identifier tags, symbol modifier, and text	0	0.25	2	4	
		V-DOMW-STNS-PUMP	V-DOMWSPUMM-M-	Booster pump stations	0	0.25	6	5	
		V-DOMW-STNS-REDIC	V-DOMWSPRDM-M-	Pressure reducing stations	0	0.25	6	5	
		V-DOMW-TANK	V-DOMWTAM-M-	Water storage tanks	0	0.25	1	3	
		V-DOMW-WELL	V-DOMWWELM-M-	Water well houses	0	0.25	1	3	
<b>Ditches or Washes</b>		V-DITCH-BOLD	V-DTCHBOM-M-	Bottom of ditch or wash	0, DITCH	0.18	3	2	
		V-DITCH-CNTR	V-DTCHCNM-M-	Centerline of ditch or wash	7	0.18	5	1	
		V-DTCH-EWAT	V-DTCHEWM-M-	Edge of water	0	0.18	4	7	
		V-DTCH-IDEN	V-DTCHIDM-M-	Ditches and washes annotation	0	0.25	3	2	
		V-DTCH-TOP~	V-DTCHTOPM-M-	Top of ditch or wash	0	0.18	3	2	
<b>Underground Ductbanks to be used when multiple systems are in one ductbank system</b>		V-DUCT-MULT	V-DUCTMULTM-M-	Ductbank	EUDUCX	0.35	83	42	
		V-DUCT-MULT-IDEN	V-DUCTMULTM-M-	Identifier tags, symbol modifier and text	0	0.25	83	42	
<b>Habitats/Landforms</b>		V-ECCO-BURR	V-ECCOBURM-M-	Burrow	0	0.35	4	7	
		V-ECCO-DENS	V-ECCODEM-M-	Den	0	0.35	4	7	
		V-ECCO-GATR	V-ECCOGATM-M-	Gator hole	2	0.25	6	5	
		V-ECCO-HUMK	V-ECCOHUM-M-	Hummocks	0	0.25	6	5	

**Discipline: Survey/Mapping**  
Model File Layers/Levels

Layer/layer Naming		AIA Format	ISO Format	Level/layer Description	Graphic Details		Model File Types
Line Style	Line Width (mm)				AutoCAD Color #	MicroStation Color #	
Survey and Mapping Plan	0	V-FLOD-BASE	V-FLODEM-	Floodwall base of wall	0	0.25	6
Mapping Hydroschematic Survey & Boundary	0	V-FLOD-BASE-IDEN	V-FLODBIM-	Floodwall base of wall annotation	0	0.25	2
Existing Utilities Plan	0	V-FLOD-CNTR	V-FLODCNTR-	Floodwall centerline	0	0.25	4
Existing Communications System Plan	0	V-FLOD-CNTR-IDEN	V-FLODCNTR-	Floodwall centerline annotation	0	0.25	6
Existing Electrical Utilities Plan	0	V-FLOD-DRAN	V-FLOODDRM-	Floodwall toe drain	0	0.25	20
Existing Airfield Lighting Plan	0	V-FLOD-DRAN-IDEN	V-FLOODDRM-	Floodwall toe drain annotation	0	0.25	6
Existing Utility Boundaries	0	V-FLOD-PILE	V-FLOODPIM-	Floodwall sheet piling	0	0.25	5
Existing Community Utilities Plan	0	V-FLOD-PILE-IDEN	V-FLOODPIM-	Floodwall sheet piling annotation	0	0.25	22
Existing HTCW Utilities Plan	0	V-FLOD-TOE	V-FLOODTOM-	Floodwall toe outline	0	0.25	22
Existing Airfield Lighting Plan	0	V-FLOD-TOE~	V-FLOODTPM-	Floodwall top of wall	0	0.25	4
Existing Airfield Lighting Plan	0	V-FLOD-TOP~	V-FLOODTPM-	Floodwall top of wall annotation	0	0.25	20
Existing Airfield Lighting Plan	0	V-FLOD-TOP-IDEN	V-FLOODTPM-	Floodwall top of wall annotation	0	0.25	6
<b>Floodwalls</b>							
Survey and Mapping Plan	6	V-FLHA-025Y	V-FLHADIM-	25 year mark	3	0.25	5
Mapping Hydroschematic Survey & Boundary	3	V-FLHA-050Y	V-FLHADIM-	50 year mark	0	0.25	4
Existing Utilities Plan	0	V-FLHA-100Y	V-FLHADIM-	100 year mark	2	0.25	7
Existing Communications System Plan	0	V-FLHA-200Y	V-FLHADIM-	200 year mark	2	0.25	4
Existing Electrical Utilities Plan	0	V-FLHA-500Y	V-FLHADIM-	500 year mark	7	0.25	5
Existing Airfield Lighting Plan	0	V-FLHA-IDEN	V-FLHADIM-	Flood hazard area annotation	0	0.25	4
<b>Floodwalls</b>							
Survey and Mapping Plan	0	V-FLHA25M-	V-FLODEM-	Floodwall base of wall	0	0.35	20
Mapping Hydroschematic Survey & Boundary	0	V-FLHA50M-	V-FLODEM-	Floodwall base of wall annotation	0	0.25	20
Existing Utilities Plan	0	V-FLHA100M-	V-FLODEM-	Floodwall centerline	0	0.18	20
Existing Communications System Plan	0	V-FLHA200M-	V-FLODEM-	Floodwall centerline annotation	0	0.25	20
Existing Electrical Utilities Plan	0	V-FLHA500M-	V-FLODEM-	Floodwall toe drain	0	0.25	6
Existing Airfield Lighting Plan	0	V-FLHA-IDEN	V-FLODEM-	Floodwall toe drain annotation	0	0.25	5
Existing HTCW Utilities Plan	0	V-FLHA25M-	V-FLOPIM-	Floodwall sheet piling	0	0.35	22
Existing Airfield Lighting Plan	0	V-FLHA50M-	V-FLOPIM-	Floodwall sheet piling annotation	0	0.25	22
Existing Airfield Lighting Plan	0	V-FLHA100M-	V-FLOPIM-	Floodwall toe outline	0	0.25	4
Existing Airfield Lighting Plan	0	V-FLHA200M-	V-FLOPIM-	Floodwall top of wall	0	0.35	2
Existing Airfield Lighting Plan	0	V-FLHA500M-	V-FLOPIM-	Floodwall top of wall annotation	0	0.25	20
<b>Liquid Fuel</b>							
Survey and Mapping Plan	2	V-FUEL-ABND-PIPE	V-FUELAPM-	Abandoned piping	2	0.25	6
Mapping Hydroschematic Survey & Boundary	0	V-FUEL-BERM	V-FUELBEM-	Berms for retaining fuel in case of major tank/line rupture	0	0.25	5
Existing Utilities Plan	0	V-FUEL-DEFL-PIPE	V-FUELDPM-	Defueling piping	0	0.25	6
Existing Communications System Plan	0	V-FUEL-DEV	V-FUELDEM-	Air eliminators, filter strainers, hydrant fill points, line vents, markers, oil/water separators, reducers, regulators, and valves	0	0.25	5
Existing Electrical Utilities Plan	0	V-FUEL-FLOW	V-FUELFLM-	Flow direction arrows	0	0.25	6
Existing Airfield Lighting Plan	0	V-FUEL-FITG	V-FUELFTM-	Caps, crosses, and fees	0	0.25	6
Existing HTCW Utilities Plan	0	V-FUEL-IDEN	V-FUELIDM-	Identifier tags, symbol modifier, and text	0	0.25	2
Existing Airfield Lighting Plan	0	V-FUEL-JBOX	V-FUELJBIM-	Junction boxes, manholes, handholes, test boxes	1	0.25	3
Existing Airfield Lighting Plan	0	V-FUEL-MAIN-PIPE	V-FUELMPM-	Main fuel piping	0	0.25	6
Existing Airfield Lighting Plan	0	V-FUEL-METR	V-FUELMEM-	Meiers	0	0.25	3
Existing Airfield Lighting Plan	0	V-FUEL-PITS-HYDR	V-FUELPHM-	Hydrant control pits	0	0.25	3
Existing Airfield Lighting Plan	0	V-FUEL-PITS-IDEN	V-FUELPIM-	Identifier tags, symbol modifier, and text	0	0.25	2
Existing Airfield Lighting Plan	0	V-FUEL-PITS-VENT	V-FUELPVM-	Vent pits	0	0.25	3
Existing Airfield Lighting Plan	0	V-FUEL-PITS-VLVE	V-FUELPPLM-	Valve pits	0	0.25	3
Existing Airfield Lighting Plan	0	V-FUEL-SERV-PIPE	V-FUELSRPM-	Service piping	0	0.25	6
Existing Airfield Lighting Plan	0	V-FUEL-STNS-IDEN	V-FUELSIM-	Identifier tags, symbol modifier, and text	0	0.25	2
Existing Airfield Lighting Plan	0	V-FUEL-STNS-PUMP	V-FUELSUM-	Booster pump stations	0	0.25	6
Existing Airfield Lighting Plan	0	V-FUEL-TANK	V-FUELTAIM-	Fuel tanks	0	0.25	3
Existing Airfield Lighting Plan	0	V-FUEL-TRCH	V-FUELTRM-	Fuel line trench	0	0.25	3
<b>Grade Linework</b>							
Survey and Mapping Plan	0	V-GRAD-AFTR	V-GRADAM-	After dredge depth	0	0.35	2
Mapping Hydroschematic Survey & Boundary	3	V-GRAD-EXIST	V-GRADEXM-	Existing grade, ground line	3	0.35	5
Existing Utilities Plan	2	V-GRAD-EXIST-BASE	V-GRADEBM-	Base survey	2	0.18	22

**Discipline: Survey/Mapping**  
Model File Layers/Levels

Layer/layer Naming		AIA Format	Level/layer Description	Graphic Details		Model File Types
Line Style	Line Width (mm)			AutoCAD Color #	MicroStation Color #	
V-GRAD-EXST-SYR1	V-GRADE1-M-	V-GRADE1-M-	Survey year one or area one	4	0.18	6
V-GRAD-EXST-SYR2	V-GRADE2-M-	V-GRADE2-M-	Survey year two or area two	5	0.18	2
V-GRAD-EXST-SYR3	V-GRADE3-M-	V-GRADE3-M-	Survey year three or area three	6	0.18	3
V-GRAD-EXST-SYR4	V-GRADE4-M-	V-GRADE4-M-	Survey year four or area four	3	0.18	113
V-GRAD-IDEN	V-GRADID-M-	V-GRADID-M-	Grade annotation	0	0.25	2
V-GRAD-PRED	V-GRADERM-	V-GRADERM-	Pre-dredge	0	0.35	4
V-GRAD-SCIN	V-GRADSCM-M-	V-GRADSCM-M-	Stability control line	7	0.35	5
<b>Grid Lines</b>		V-GRID-FRAM	V-GRIDFRM-M-	Frame	0	0.35
V-GRID-MAJR		V-GRIDMAM-M-	Major grid lines	1	0.25	8
V-GRID-MINR		V-GRIDMM-M-	Minor grid lines	1	0.18	9
V-GRID-TEXT		V-GRIDTEM-M-	Border text, annotation	0	0.25	2
<b>Geothermal Heat Pump System</b>		V-GTHP-EOPM	V-GTHPEOPM-M-	Geothermal heat pump system equipment	0	0.25
V-GTHP-IDEN		V-GTHPIDM-M-	Geothermal heat pump annotation	0	0.35	2
V-GTHP-RETN-PIPE		V-GTHPREPM-M-	Geothermal heat pump system return piping	0	0.35	203
V-GTHP-SUPP-PIPE		V-GTHPSPM-M-	Geothermal heat pump system supply piping	0	0.35	203
<b>High Temperature/Chilled Water System</b>		V-HTCW-ABND-PIPE	V-HTCWAAMP-M-	Abandoned piping	2	0.18
V-HTCW-CWTR-MAIN		V-HTCWCWCM-M-	Main chilled water piping	0	0.25	163
V-HTCW-CWTR-PLNT		V-HTCWCWCM-M-	Chilled water plant	0	0.25	163
V-HTCW-CWTR-SERV		V-HTCWCWSM-M-	Chilled water service piping	0	0.18	163
V-HTCW-DEV/C		V-HTCWDEM-M-	Rigid anchors, anchor guides, reducers, markers, regulators, tanks, and valves	0	0.25	6
V-HTCW-FLOW		V-HTCWFELM-M-	Flow direction arrows	0	0.18	3
V-HTCW-FITG		V-HTCWFITM-M-	Caps and flanges	0	0.25	6
V-HTCW-HWTR-MAIN		V-HTCWHWM-M-	Main high temperature piping	0	0.25	113
V-HTCW-HWTR-PLNT		V-HTCWHWM-M-	High temperature water plant	0	0.25	113
V-HTCW-HWTR-SERV		V-HTCWHWSM-M-	High temperature service piping	0	0.18	113
V-HTCW-IDEN		V-HTCWIDEM-M-	Identifier tags, symbol modifier, and text	0	0.25	2
V-HTCW-JBOX		V-HTCWNJBM-M-	Junction boxes, manholes, handholes, test boxes	0	0.18	1
V-HTCW-LWTR-MAIN		V-HTCWLWM-M-	Main low temperature piping	0	0.25	1
V-HTCW-LWTR-SERV		V-HTCWLWSM-M-	Low temperature service piping	0	0.18	1
V-HTCW-PITS		V-HTCWPPTM-M-	Valve pits/vaults, steam pits	0	0.18	3
V-HTCW-PLNT-DEN		V-HTCWPPLTM-M-	Identifier tags, symbol modifier, and text	0	0.25	2
V-HTCW-BETN-PIPE		V-HTCWBPTM-M-	Return for all HTCW lines	0	0.18	5
V-HTCW-STEM-MAIN		V-HTCWSMM-M-	Main steam piping	0	0.25	113
V-HTCW-STEM-SERV		V-HTCWSSTM-M-	Steam service piping	0	0.18	113
V-HTCW-STNS-IDEN		V-HTCWSIM-M-	Pump station identifier tags, symbol modifier, and text	0	0.25	6
V-HTCW-STNS-PUMP		V-HTCWSUIM-M-	Pump stations	0	0.25	6
<b>Industrial Waste Water</b>		V-INDW-ABND-PIPE	V-INDWAPM-M-	Abandoned piping	2	0.25
V-INDW-DEV/C		V-INDWDEM-M-	Grit chambers, meters, flumes, neutralizers, oil/water separators, ejectors, tanks, and valves	0	0.25	6
V-INDW-FLOW		V-INDWFLM-M-	Flow direction arrows	0	0.25	6
V-INDW-FITG		V-INDWFITM-M-	Caps and cleanouts	0	0.25	6
V-INDW-IDEN		V-INDWIDM-M-	Identifier tags, symbol modifier, and text	0	0.25	2

**Discipline: Survey/Mapping**  
Model File Layers/Levels

Level/layer Naming		ISO Format	Level/layer Description	Graphic Details		Model File Types	
Level	Layer			Line Style	Line Width (mm)		
V-INDW-J-BOX	V-INDW/JBM-	V-INDW/JBM-	Junction boxes and manholes:	0	0.25	1	
V-INDW-LAGN	V-INDW/LAM-	V-INDW/LAM-	Lagoons	0	0.25	5	
V-INDW-LAGN-IDEN	V-INDW/LAGN-IDEN	V-INDW/LAGN-IDEN	Identifier tags, symbol modifier, and text	0	0.25	6	
V-INDW-MAIN-PIPE	V-INDW/MAIN-PIPE	V-INDW/MAIN-PIPE	Main industrial waste water piping	WASTE	0.25	6	
V-INDW-PLINT	V-INDW-PLINT	V-INDW/PLINT	Treatment plants	0	0.25	6	
V-INDW-SERV-PIPE	V-INDW-SERV-PIPE	V-INDW/SWP-	Industrial waste water service piping	0	0.25	1	
V-INDW-SIGN	V-INDW-SIGN	V-INDW/SIGN-	Surface markers/signs	0	0.25	1	
V-INDW-STNS-IDEN	V-INDW-STNS-IDEN	V-INDW/SIGN-	Identifier tags, symbol modifier, and text	0	0.25	4	
V-INDW-STNS-LIFT	V-INDW-STNS-LIFT	V-INDW/SIGN-	Lift stations	0	0.25	5	
<b>Irrigation</b>		V-IRRGE-QOPM	Irrigation equipment (e.g., controllers, valves, etc.)	0	0.25	5	
V-IRRGE-IDEN	V-IRRGE-IDEN		Irrigation annotation	0	0.25	2	
V-IRR-PIPE	V-IRR-PIPE		Irrigation piping	0	0.25	6	
V-IRRGE-WELL	V-IRRGE-WELL		Irrigation wells	0	0.18	3	
				0	0.25	2	
<b>Joints</b>		V-JNTS-ONSL	V-JNTS-ONSL-	Construction joints - longitudinal	0	0.25	6
V-JNTS-ONST	V-JNTS-ONST		Construction joints - transverse	0	0.25	6	
V-JNTS-CNTL	V-JNTS-CNTL		Contraction joints - longitudinal	0	0.25	2	
V-JNTS-ONTT	V-JNTS-ONTT		Contraction joints - transverse	0	0.25	4	
V-JNTS-EDGE	V-JNTS-EDGE		Thickened edges	0	0.25	4	
V-JNTS-EXPN	V-JNTS-EXPN		Expansion joints	0	0.25	7	
V-JNTS-IDEN	V-JNTS-IDEN		Joint annotation	0	0.25	12	
				0	0.25	27	
				0	0.25	4	
<b>Levees</b>		V-LEVE-BANK-IDEN	V-LEVE-BANK-IDEN	Levee top of bank annotation	0	0.25	20
V-LEVE-BANK-TOP~	V-LEVE-BANK-TOP~		V-LEVEBIM-	Levee top of bank	0	0.25	20
V-LEVE-BERM	V-LEVE-BERM		V-LEVEBIM-	Existing berms	0	0.25	6
V-LEVE-BNCH	V-LEVE-BNCH		V-LEVEBIM-	Levee bench design feature lines (breaklines from DTM's)	0	0.25	6
V-LEVE-BNCH-IDEN	V-LEVE-BNCH-IDEN		V-LEVEBIM-	Levee bench annotation	0	0.18	2
V-LEVE-BRRW	V-LEVE-BRRW		V-LEVEBIM-	Borrow limits	0	0.35	4
V-LEVE-CNTR	V-LEVE-CNTR		V-LEVECTM-	Levee centerline	7	0.18	7
V-LEVE-CNTR-IDEN	V-LEVE-CNTR-IDEN		V-LEVECTM-	Levee centerline annotation	0	0.25	20
V-LEVE-IDEN	V-LEVE-IDEN		V-LEVEIDM-	Levee annotation	0	0.25	2
V-LEVE-OTLN	V-LEVE-OTLN		V-LEVEOTLM-	Levee outline	0	0.35	4
V-LEVE-SLOP	V-LEVE-SLOP		V-LEVESFM-	Levee slope indicator with annotator	0	0.25	2
V-LEVE-STAT	V-LEVE-STAT		V-LEVESTM-	Levee stationing	0	0.25	4
V-LEVE-TOE~	V-LEVE-TOE~		V-LEVEOTM-	Levee toe	2	0.25	20
V-LEVE-TOE--IDEN	V-LEVE-TOE--IDEN		V-LEVEOTM-	Levee toe annotation	0	0.18	6
<b>Lights</b>		V-LITE-EXTR	V-LITEEXTM-	Exterior lights	0	0.35	203
V-LITE-EXTR-IDEN	V-LITE-EXTR-IDEN		V-LITEEIM-	Exterior light identifier tags, symbol modifiers, and text	0	0.25	45
<b>Military Ranges</b>		V-MILR-BATP	V-MILRBATM-	Battle Positions	0	0.35	4
V-MILR-CAMS	V-MILRCAMS		V-MILRCAM-	Range cameras	0	0.25	6
V-MILR-FOXH	V-MILRFOM-		V-MILRFOM-	Fox holes and pits	0	0.25	6
V-MILR-MATS	V-MILRMATM-		V-MILRMATM-	Moving army targets	0	0.35	4
V-MILR-MITS	V-MILRMITM-		V-MILRMITM-	Moving infantry targets	0	0.35	4
V-MILR-MITS-IDEN	V-MILRMITD-IDEN		V-MILRMITDM-	Moving infantry targets annotation	0	0.25	2

**Discipline: Survey/Mapping**  
Model File Layers/Levels

Layer/layer Naming		AIA Format	ISO Format	Level/layer Description	Graphic Details		Model File Types
Level	Layer				Line Style	Line Width (mm)	
V-MILR-PUTS	V-MILRPUM-	V-MILR-PUTS	V-MILRPUM-	Pop up targets	0	0.35	4
V-MILR-PUTS-IDEN	V-MILRPUM-	V-MILR-PUTS-IDEN	V-MILRPUM-	Pop up targets annotation	0	0.25	2
V-MILR-SATS	V-MILRSATM-	V-MILR-SATS	V-MILRSATM-	Stationary army targets	0	0.35	4
V-MILR-SATS-IDEN	V-MILRSATM-	V-MILR-SATS-IDEN	V-MILRSATM-	Stationary army targets.annotation	0	0.25	2
V-MILR-SITS	V-MILRSIM-	V-MILR-SITS	V-MILRSIM-	Stationary infantry targets	0	0.35	4
V-MILR-SITS-IDEN	V-MILRSIM-	V-MILR-SITS-IDEN	V-MILRSIM-	Stationary infantry targets.annotation	0	0.25	2
<b>Natural Gas</b>		V-NGAS-SABND-PIPE	V-NGASAPM-	Abandoned piping	2	0.25	6
V-NGAS-DEV/C		V-NGASDEM-	V-NGASDEM-	Hydrant fill points, lights, vents, markers, rectifiers, reducers, regulators, sources, drip pots, taps, and valves.	0	0.25	6
V-NGAS-DEV/C-IDEN		V-NGASDEM-	V-NGASDEM-	Identifier tags, symbol modifier, and text	0	0.25	6
V-NGAS-FLOW		V-NGASFLM-	V-NGASFLM-	Flow direction arrows	0	0.25	6
V-NGAS-FITG		V-NGASFITM-	V-NGASFITM-	Caps, crosses, and tees	0	0.25	6
V-NGAS-IDEN		V-NGASDEM-	V-NGASDEM-	Identifier tags, symbol modifier, and text	0	0.25	2
V-NGAS-MAIN-PIPE		V-NGASM-DEM-	V-NGASM-DEM-	Main natural gas piping	NTGSX	0.25	6
V-NGAS-METR		V-NGASDEM-	V-NGASDEM-	Meiers	0	0.25	3
V-NGAS-PITS-IDEN		V-NGASPM-	V-NGASPM-	Identifier tags, symbol modifier, and text	0	0.25	3
V-NGAS-PITS-VENT		V-NGASPM-	V-NGASPM-	Vent pits	0	0.25	3
V-NGAS-PLTS-VALVE		V-NGASPM-	V-NGASPM-	Valve pits/boxes	0	0.25	3
V-NGAS-SERV-PIPE		V-NGASSPM-	V-NGASSPM-	Service piping	0	0.25	1
V-NGAS-SIGN		V-NGASSIM-	V-NGASSIM-	Surface markers/signs	0	0.25	1
V-NGAS-STNS-IDEN		V-NGASIM-	V-NGASIM-	Identifier tags, symbol modifier, and text	0	0.25	2
V-NGAS-STNS-PUMP		V-NGASSUM-	V-NGASSUM-	Compressor stations	0	0.25	6
V-NGAS-STNS-REDIC		V-NGASSRM-	V-NGASSRM-	Reducing stations	0	0.25	6
V-NGAS-TANK		V-NGASTAM-	V-NGASTAM-	Tanks	0	0.18	3
<b>Obstructions</b>		V-OBST-AIRS	V-OBSTADM-	Airspace obstructions	0	0.25	3
V-OBST-STAIRS-IDEN		V-OBSTADM-	V-OBSTADM-	Airspace obstruction annotation	0	0.25	2
V-OBST-UWTR		V-OBSTUWM-	V-OBSTUWM-	Underwater obstructions (e.g., sunken ship, barge, etc.)	2	0.25	1
V-OBST-ST-UWTR-IDEN		V-OBSTUWM-	V-OBSTUWM-	Underwater obstruction annotation	0	0.25	2
<b>Overrun Areas</b>		V-OVRN-CNTR	V-OVRNCNM-	Centerlines	7	0.18	1
V-OVRN-CNTR-IDEN		V-OVRNCNM-	V-OVRNCNM-	Centerline annotation	0	0.25	2
V-OVRN-IDEN		V-OVRNIDM-	V-OVRNIDM-	Airfield overrun area - annotation	0	0.25	2
V-OVRN-OTLN		V-OVRNIDM-	V-OVRNIDM-	Airfield overrun area - outlines	0	0.25	4
V-OVRN-SHL-D-MRKG		V-OVRNIDM-	V-OVRNIDM-	Shoulder markings	0	0.25	4
<b>Pads (Arm/Disarm/Calibration, etc.)</b>		V-PADS-CNTR	V-PADSCNM-	Centerlines	7	0.18	1
V-PADS-CNTR-IDEN		V-PADSCNM-	V-PADSCNM-	Centerline annotation	0	0.25	2
V-PADS-IDEN		V-PADSDNM-	V-PADSDNM-	Pads - annotation	0	0.25	2
V-PADS-OTLN		V-PADSDNM-	V-PADSDNM-	Pad - outlines	0	0.25	4
V-PADS-SHLD		V-PADSSHDM-	V-PADSSHDM-	Shoulders with annotation	0	0.18	2
<b>Power</b>		V-POWRE-DEV	V-POWRDEM-	Capacitors, voltage regulators, motors, buses, generators, meters, grounds, and markers	0	0.35	23
V-POWRE-IDEN		V-POWRIDM-	V-POWRIDM-	Power annotation	0	0.35	2
V-POWR-JBOX		V-POWRJBM-	V-POWRJBM-	Junction boxes, pull boxes, manholes, handholes, pedestals, splice:	0	0.35	32

**Discipline: Survey/Mapping**  
Model File Layers/Levels

Layer/layer Naming		ISO Format	Level/layer Description	Graphic Details		Model File Types
AIA Format	Line Style			Line Width (mm)	MicroStation Color #	
V-POW-POLE	V-POWRPCM-	Power poles		0	0.35	203
V-POW-POLE-GUYS	V-POWRPCM-	Guying equipment		0	0.35	203
V-POW-POLE-IDEN	V-POWRPCM-	Identifier tags, symbol modifiers, and text		0	0.25	203
V-POW-POLE-M	V-POWRSLIM-	Other substation equipment		0	0.35	23
V-POW-POLE-SUBS	V-POWRSLIM-			0	0.35	23
V-POW-SWCH	V-POWRSM-	Fuse cutouts, pole mounted switches, circuit breakers, gang operated disconnects		0	0.35	46
V-POW-XFMR-PADM	V-POWRXFM-	Reclosers, cubicle switches		0	0.35	41
V-POW-XFMR-POLM	V-POWRXFM-	Pad mounted transformers		0	0.35	23
V-POW-XFMR-POLS	V-POWRXFM-	Pole mounted transformers		0	0.35	23
<b>Primary Electrical Cables</b>						
V-PRIM-OVHD	V-PRIMOVM-	Overhead electrical utility lines		EPARX	0.35	7
V-PRIM-OV-HD-DEN	V-PRIMOIDN-	Identifier tags, symbol modifiers, and text		0	0.25	4
V-PRIM-LINDR	V-PRIMUNDR-	Underground electrical utility lines		EPUGX	0.35	4
V-PRIM-UNDR-DEN	V-PRIMUDN-	Identifier tags, symbol modifiers, and text		0	0.25	4
<b>Parking Lots</b>						
V-PRKG-CNTR	V-PRKGCTM-	Parking lot centerlines		7	0.18	1
V-PRKG-CNTR-IDEN	V-PRKGCTM-	Parking lot centerline annotation		0	0.18	1
V-PRKG-CURB	V-PRKGCM-	Curb and gutters		0	0.25	3
V-PRKG-DEAN	V-PRKGDRM-	Drainage slope indications		0	0.25	1
V-PRKG-FIXT	V-PRKGFM-	Parking lot fixtures (e.g., wheel stops, parking meters)		0	0.25	91
V-PRKG-FLINE	V-PRKGFLM-	Fire lanes		0	0.18	1
V-PRKG-IDEN	V-PRKGIDM-	Parking lot annotation		0	0.25	6
V-PRKG-MRKG	V-PRKGMRM-	Pavement markings		0	0.25	2
V-PRKG-OTLN	V-PRKGOTM-	Parking lot outlines		0	0.35	4
V-PRKG-SIGN	V-PRKGSM-	Signs		0	0.25	2
<b>Property</b>						
V-PROP-BRNG	V-PROPERM-	Bearings and distance labels		0	0.35	6
V-PROP-ESMT	V-PROPESM-	Easements		CONE	0.50	7
V-PROP-IDEN	V-PROPIDM-	Property annotation		0	0.25	6
V-PROP-LINE	V-PROPLIM-	Property lines (Existing recorded plats)		PROPL	0.35	2
V-PROP-QTRS	V-PROPQTM-	Quarter lines		11	0.35	6
V-PROP-RWAY	V-PROPRWM-	Right of ways		6	0.50	7
V-PROP-SECT	V-PROPSERM-	Section lines		7	0.35	6
V-PROP-SECT-IDEN	V-PROPSIDN-	Section lines annotation		0	0.25	6
V-PROP-SUBD	V-PROPSUM-	Subdivision (interior) lines		0	0.25	1
V-PROP-SATS	V-PROPSXM-	Sixteenth lines (40 lines)		16THLN	0.35	6
V-PROP-TSHP	V-PROPTHM-	Township/range lines		4	0.35	6
V-PROP-TSHP-IDEN	V-PROPTHM-	Township/range lines annotation		0	0.25	6
<b>Pavements</b>						
V-PVMT-ASPH	V-PVMTASM-	Pavement pattern - asphalt		0	0.18	8
V-PVMT-CONC	V-PVMTCOM-	Pavement pattern - concrete		0	0.18	9
V-PVMT-GRVL	V-PVMTGRM-	Pavement pattern - gravel		0	0.18	8
V-PVMT-IDEN	V-PVMTIDM-	Road, parking lot, railroad, airfield pavement annotation		0	0.25	4
V-PVMT-MRKG	V-PVMTMRM-	Pavement markings		0	0.35	2
V-PVMT-PAIT	V-PVMTPAM-	Joint patterns, text and dimensions		0	0.35	2
<b>Railroads</b>						
V-RAIL-CNTR	V-RAILCNM-	Railroad track centerlines		7	0.18	3
V-RAIL-CNTR-IDEN	V-RAILCNM-	Railroad track centerline annotation		0	0.25	1

**Discipline: Survey/Mapping**  
Model File Layers/Levels

Layer/layer Naming		ISO Format	Level/layer Description	Graphic Details		Model File Types
Level	layer			Line Style	Line Width (mm)	
V-RAIL-EQPM	V-RAILEQFM-	V-RAILEQFM-	Railroad equipment (e.g., gates, signals)	0	0.25	91
V-RAIL-IDEN	V-RAILIDNM-	V-RAILIDNM-	Railroad - annotation	0	0.25	2
V-RAIL-TRAK	V-RAILTRFM-	V-RAILTRFM-	Railroad tracks	RAILS	0.25	4
<b>Rivers</b>		V-RVR-BANK-TOP~	V-RVRBFTM- Top of river bank	0	0.25	5
		V-RVR-BOTM	V-RVRBOTM- River bottom	0	0.25	5
		V-RIVRCNTR	V-RIVRCNTR- Centerline of river	7	0.18	1
		V-RVR-EDGE	V-RVREDFM- River edge	0	0.35	5
		V-RVR-IDEN	V-RVRIDFM- Identifier tags, symbol modifiers, and text	0	0.25	2
<b>Roads, Streets, and Highways</b>		V-ROAD-ASPH	V-ROADASFM- Road outlines - asphalt surface	0	0.18	8
		V-ROAD-CNTR	V-ROADCTM- Road centerlines	7	0.18	1
		V-ROAD-CNTR-IDEN	V-ROADCINM- Road centerline annotation	0	0.18	1
		V-ROAD-CONC	V-ROADCOM- Road outlines - concrete surface	0	0.18	7
		V-ROAD-CORB	V-ROADCUM- Curbs and gutters	0	0.25	6
		V-ROAD-GRAIL	V-ROADGRM- Guard rails	GUARD	0.25	6
		V-ROAD-GRVL	V-ROADGM- Road outlines - gravel surface	0	0.18	20
		V-ROAD-IDEN	V-ROADIDFM- Road, street, highway annotation	0	0.25	6
		V-ROAD-MRKG	V-ROADMRFM- Pavement markings	0	0.25	2
		V-ROAD-OTLN	V-ROADOTM- Road outlines	0	0.25	4
		V-ROAD-PATT	V-ROADPAM- Joint patterns, text and dimensions	0	0.25	2
		V-ROAD-SHLD	V-ROADSHM- Roadway shoulders	0	0.25	6
		V-ROAD-SIGN	V-ROADSIS- Signs	0	0.18	1
		V-ROAD-UPVD	V-ROADUPM- Road outlines - unpaved surface	0	0.18	3
<b>Riprap and Other Permanent Erosion Control Items</b>		V-RRAP-GABN	V-RRVRGAM- Gabions	V	0.18	1
		V-RRAP-MATS	V-RRAPNAM- Articulated concrete mats	V	0.18	3
		V-RRAP-RWNT	V-RRVRRVM- Revetments	V	0.18	1
		V-RRAP-WEIR	V-RRRAPWEIM- Weirs	V	0.18	2
<b>Runways</b>		V-RUNW-BLST	V-RUNWBLSM- Blast pad and stopway markings	0	0.25	1
		V-RUNW-CNTR	V-RUNWCNFM- Centerlines	7	0.25	1
		V-RUNW-CNTR-MRKG	V-RUNWCNFM- Centerline markings	0	0.25	1
		V-RUNW-DISP	V-RUNWDISFM- Displaced threshold markings	0	0.25	1
		V-RUNW-DIST	V-RUNWDISM- Fixed distance markings	0	0.25	1
		V-RUNW-EDGE	V-RUNWBLFM- Airfield runway edges	0	0.25	6
		V-RUNW-IDEN	V-RUNWIDFM- Airfield runway annotation	0	0.25	2
		V-RUNW-SHLD	V-RUNWSHFM- Shoulder markings	0	0.25	6
		V-RUNW-SIDE	V-RUNWSIDFM- Side stripes	0	0.25	4
		V-RUNW-TDZM	V-RUNWTDM- Touchdown zone markers	0	0.25	6
		V-RUNW-THR5	V-RUNWTHFM- Threshold markers	0	0.25	6
<b>Secondary Electrical Cables</b>		V-SEC0D-OVHD	V-SEC0DM- Overhead electrical utility lines	ESARX	0.35	163
		V-SEC0D-OVHD-IDEN	V-SEC0DM- Identifier tags, symbol modifiers, and text	0	0.25	163
		V-SEC0D-UNDR	V-SEC0DM- Underground electrical utility lines	ESUGX	0.35	163
		V-SEC0D-UNDR-IDEN	V-SEC0DM- Identifier tags, symbol modifiers, and text	0	0.25	163
<b>Site Features</b>						

**Discipline: Survey/Mapping**  
Model File Layers/Levels

Layer/layer Naming		AIA Format		Level/layer Description		Graphic Details		Model File Types	
		V-SITE-EWAT	V-SITEEWATM-	Edge of water		Line Style	Line Width (mm)	MicroStation Color #	AutoCAD Color #
		V-SITE-FENC	V-SITEFENC-	Fences and handrails			0	0.35	162
		V-SITE-FENC-IDEN	V-SITEFENCIDEN-	Fence, handrail, ramp, and trail annotation			0	0.25	6
		V-SITE-FLDS	V-SITEFLDS-	Stump fields			0	0.25	6
		V-SITE-IDEN	V-SITEIDEN-	Existing site feature/structure annotation			0	0.25	1
		V-SITE-OTLN	V-SITEOTLN-	Existing site features (play structures, bike racks, benches, recreational equipment)			0	0.25	6
		V-SITEROCK	V-SITEROCK-	Rock and rock outcroppings, boulders and cobble			0	0.50	7
		V-SITE-STRC	V-SITESRCM-	Structures (bridges, sheds, foundation pads, footings, etc.)			0	0.25	1
		V-SITE-STRS	V-SITESTRSM-	Stairs and ramps			0	0.25	22
		V-SITE-VEGE	V-SITEVEGM-	Existing tree-lines and vegetation			0	0.25	6
		V-SITE-VEGI-DEN	V-SITEVEGIDEN-	Existing tree-lines and vegetation - identifier			0	0.35	82
		V-SITE-WALK	V-SITEWALKM-	Walks, trails, and bicycle paths			0	0.25	2
		V-SITE-WATR	V-SITEWATRM-	Water features			0	0.35	33
<b>Special Systems</b>		V-SPCL-SYST	V-SPCLSPSTM-	Special systems (UMCS, EMCS, CATV, etc.)			0	0.35	203
		V-SPCL-SYST-IDEN	V-SPCLSYSTIDEN-	Special systems (UMCS, EMCS, CATV, etc.) identifier tags, symbol modifier, and text			0	0.25	203
		V-SPCL-TRAF	V-SPCLTRAFM-	Traffic signal system			0	0.35	203
		V-SPCL-TRAFF-IDEN	V-SPCLTRAFFIDEN-	Traffic signal identifier tags, symbol modifier, and text			0	0.25	203
<b>Sanitary Sewer</b>		V-SSWRABND-PIPE	V-SSWRABNDM-	Abandoned piping			2	0.25	6
		V-SSWR-DEVC	V-SSWRDEVM-	Grease traps, grit chambers, flumes, neutralizers, oil/water separators, ejectors, and valves			0	0.25	6
		V-SSWR-DEVCD-IDEN	V-SSWRDEVCDIDEN-	Identifier tags, symbol modifier, and text			0	0.18	6
		V-SSWR-FILT	V-SSWRFILTM-	Filtration beds			0	0.25	3
		V-SSWR-FILT-IDEN	V-SSWRFILTIDEN-	Identifier tags, symbol modifier, and text			0	0.25	3
		V-SSWR-FLOW	V-SSWRFLWM-	Flow direction arrows			0	0.25	6
		V-SSWR-FITG	V-SSWRFITGM-	Caps and cleanouts			0	0.25	6
		V-SSWR-IDEN	V-SSWRIDENM-	Identifier tags, symbol modifier, and text			0	0.25	2
		V-SSWR-JBOX	V-SSWRJBOXM-	Junction boxes and manholes			0	0.25	1
		V-SSWR-JBOX-IDEN	V-SSWRJBOXIDEN-	Identifier tags, symbol modifier, and text			0	0.25	1
		V-SSWR-LAGN	V-SSWRLAGNM-	Lagoons			0	0.25	3
		V-SSWR-LEAC	V-SSWRLEACM-	Leach field			0	0.25	2
		V-SSWR-MAIN-PIPE	V-SSWRMAINPIM-	Sanitary sewer piping			0	0.25	6
		V-SSWR-NITF	V-SSWRNITFM-	Nitrification, drain fields			0	0.25	3
		V-SSWR-PINT	V-SSWRPINTM-	Treatment plants			0	0.25	6
		V-SSWR-SERV-PIPE	V-SSWRSERVPM-	Sanitary sewer service piping			0	0.25	1
		V-SSWR-SIGN	V-SSWRSIGNM-	Surface markers/signs			0	0.25	3
		V-SSWR-STNS-IDEN	V-SSWRSTNSIDEN-	Identifier tags, symbol modifier, and text			0	0.25	2
		V-SSWR-STNS-PUMP	V-SSWRSTNSPUMPM-	Booster pump stations			0	0.25	6
		V-SSWR-TANK	V-SSWRTANKM-	Septic tanks			0	0.25	3
<b>Storm Sewer</b>		V-STRMABND-PIPE	V-STRMAPDM-	Abandoned piping			2	0.25	6
		V-STRM-AFFF	V-STRMAFFM-	AFFF lagoon/detention pond			0	0.25	3
		V-STRM-CHUT	V-STRMCHUTM-	Chutes and concrete erosion control structures			0	0.25	1
		V-S-TRM-CULV	V-STRMCULVM-	Culverts			0	0.25	3
		V-STRM-DEVIC	V-STRMDEVICM-	Downspouts, flumes, oil/water separators, and flap gates			0	0.25	6
		V-STRM-FLOW	V-STRMFLOWM-	Flow direction arrows			0	0.25	6

**Discipline: Survey/Mapping**  
Model File Layers/Levels

Level/Layer Naming		AIA Format	Level/Layer Description	Graphic Details		Model File Types
Level	Layer			Line Style	Line Width (mm)	
V-STRM-FMON	V-STRMFMM-	V-STRMFMM-	Flow monitoring station	0	0.25	6
V-STRM-FTTG	V-STRMFTT-	V-STRMFTT-	Caps and cleanouts	0	0.25	5
V-STRM-HDWL	V-STRMHDM-	V-STRMHDM-	Headwalls and endwalls	0	0.35	6
V-STRM-IDEN	V-STRMIDM-	V-STRMIDM-	Identifier tags, symbol modifier, and text	0	0.25	7
V-STRM-INLT	V-STRMINLT-	V-STRMINLT-	Inlets (curb, surface, and catch basins)	0	0.25	4
V-STRM-LAGN	V-STRMLAGN-	V-STRMLAGN-	Lagoons, ponds, watersheds, and basins	0	0.25	3
V-STRM-MAIN-PIPE	V-STRMMAIN-PIPE	V-STRMMAIN-PIPE	Storm sewer piping	0	0.25	3
V-STRM-MHOL	V-STRMMHM-	V-STRMMHM-	Manholes	STRAFX	0.25	6
V-STRM-ROOF	V-STRMRM-	V-STRMRM-	Roof drain line	0	0.25	1
V-STRM-SERV-PIPE	V-STRMSPM-	V-STRMSPM-	Storm sewer service piping	0	0.25	3
V-STRM-SIGN	V-STRMSM-	V-STRMSM-	Surface markers/signs	0	0.25	1
V-STRM-STNS-DEN	V-STRMSNSDEN-	V-STRMSNSDEN-	Identifier tags, symbol modifier, and text	0	0.25	2
V-STRM-STNS-PUMP	V-STRMSNSPUMP-	V-STRMSNSPUMP-	Pump stations	0	0.25	6
V-STRM-SUBS-PIPE	V-STRMSUM-	V-STRMSUM-	Subsurface drain piping	0	0.25	3
<b>Survey</b>		V-SURV-DATA	V-SURVIDAM-	Survey data (benchmarks and horizontal control points or monuments)	0	0.25
V-SURV-IDEN	V-SURVIDEN-	V-SURVIDEN-	Survey, baseline, and control line annotation	0	0.25	6
V-SURV-LINE	V-SURVILIN-	V-SURVILIN-	Survey, baseline, and control line	2	0.25	4
V-SURV-SYMB	V-SURVSYMB-	V-SURVSYMB-	Survey line symbol (PIs)	0	0.35	2
<b>Taxiways</b>		V-TAXI-CNTR	V-TAXICNM-	Centerline's	7	0.18
V-TAXI-CNTR-IDEN	V-TAXICNTR-IDEN	V-TAXICNM-	Centerline annotation	0	0.25	2
V-TAXI-CNTR-MRKG	V-TAXICNTR-MRKG	V-TAXICNM-	Centerline markings	0	0.18	3
V-TAXI-EDGE	V-TAXIEDGE-	V-TAXIEDM-	Edge markings	0	0.25	4
V-TAXI-HOLD	V-TAXIHOM-	V-TAXIHOM-	Holding lines	0	0.25	7
V-TAXI-IDEN	V-TAXIIDEN-	V-TAXIIDM-	Taxiway - annotation	0	0.25	2
V-TAXI-OTLN	V-TAXIOTLN-	V-TAXIOTM-	Taxiway - outlines	0	0.25	4
V-TAXI-SHLD	V-TAXISHM-	V-TAXISHM-	Shoulders with annotation	0	0.25	2
<b>Topography</b>		V-TOPO-BDRY-EXTR	V-TOPOBEM-	Surface exterior boundary	0	0.18
V-TOPO-BDRY-INTR	V-TOPOBIM-	V-TOPOBIM-	Surface interior boundary	0	0.18	3
V-TOPO-BKLN	V-TOPOBKLM-	V-TOPOBKLM-	Breaklines	2	0.18	1
V-TOPO-BKLN-COMM	V-TOPOBKLCOMM-	V-TOPOBKCM-	Subsurface utilities, communications breakline	4	0.35	7
V-TOPO-BKLN-DOWN	V-TOPOBKLDOWN-	V-TOPOBKDM-	Subsurface utilities water breakline	0	0.35	7
V-TOPO-BKLN-ELEC	V-TOPOBKLEEC-	V-TOPOBKEM-	Subsurface utilities, electric breakline	0	0.35	7
V-TOPO-BKLN-FUEL	V-TOPOBKLFUEL-	V-TOPOBKFM-	Subsurface utilities liquid fuel breakline	LICPET	0.35	7
V-TOPO-BKLNGAS	V-TOPOBKNGAS-	V-TOPOBKGM-	Subsurface utilities natural gas breakline	NTGASN	0.35	7
V-TOPO-BKLN-SSWR	V-TOPOBKLNSSWR-	V-TOPOBKSM-	Subsurface utilities sanitary sewer breakline	SSWAF	0.35	7
V-TOPO-BKLN-STRM	V-TOPOBKLNSTRM-	V-TOPOBKTM-	Subsurface utilities storm sewer breakline	STRAF	0.35	7
V-TOPO-BORE	V-TOPOBORE-	V-TOPOBOM-	Boring locations and text	0	0.25	6
V-TOPO-COOR	V-TOPOCOOR-	V-TOPOCOM-	Coordinate grid ticks and text	0	0.25	122
V-TOPO-COOR-ALO	V-TOPOCOORALO-	V-TOPOCLOM-	Latitude and longitude grid ticks	0	0.18	3
V-TOPO-COOR-STAT	V-TOPOCOORSTAT-	V-TOPOCSM-	State Plane coordinate ticks	0	0.18	2
V-TOPO-DIM0	V-TOPODIM0-	V-TOPODOM-	DTM obscure area boundary	0	0.25	6
V-TOPO-DIMP	V-TOPODIMP-	V-TOPODPM-	DTM points	0	0.25	6
V-TOPO-DINT	V-TOPODINT-	V-TOPODPM-	DTM triangles	0	0.25	22
V-TOPO-MAJR	V-TOPOMJM-	V-TOPOMM-	Major contours	0	0.25	2

**Discipline: Survey/Mapping**  
Model File Layers/Levels

Layer/layer Naming		ISO Format	Level/layer Description	Graphic Details		Model File Types
Level	Layer			Line Style	Line Width (mm)	
V-TOPO-MAJ-IDEN	V-TOPONAM-	V-TOPONAM-	Major contours - annotation	0	0.25	2
V-TOPO-MINR	V-TOPONMM-	V-TOPONMM-	Minor contours	0	0.18	3
V-TOPO-MINR-DEN	V-TOPOMM-	V-TOPOMM-	Minor contours - annotation	0	0.18	3
V-TOPO-PERM	V-TOPOPFM-	V-TOPOPFM-	Surface perimeter	0	0.18	3
V-TOPO-SHAP	V-TOPOSHM-	V-TOPOSHM-	Inroads generated shapes/lines	0	0.18	1
V-TOPO-SHOR	V-TOPOSH-	V-TOPOSH-	Shorelines, land features, and reference:	0	0.25	4
V-TOPO-SLOP-FILL	V-TOPOSMF-	V-TOPOSMF-	Cutoff slopes	0	0.25	2
V-TOPO-SLOP-IDEN	V-CHANSIM-	V-CHANSIM-	Cutoff slope, top/foe slope annotation	0	0.25	2
V-TOPO-SLOP-TOPT	V-TOPOST-	V-TOPOST-	Top/foe slopes	0	0.25	6
V-TOPO-SOUN	V-TOPOSOM-	V-TOPOSOM-	Soundings and overbanks	0	0.18	5
V-TOPO-SPOT	V-TOPOSP-	V-TOPOSP-	Spot elevations	0	0.25	2
V-TOPO-VOID	V-TOPOVDM-	V-TOPOVDM-	Surface void region	0	0.18	1
V-TOPO-WATR	V-TOPOWAM-	V-TOPOWAM-	Water level reference (e.g., LWRP, SWP, etc.)	0	0.35	3
<b>Airfield Traffic Areas</b>						
V-TRAF-IDEN	V-TRAFDIM-	V-TRAFDIM-	Airfield traffic area annotation	0	0.25	2
V-TRAF-TYPA	V-TRAFTAM-	V-TRAFTAM-	Type A traffic area	4	0.35	7
V-TRAF-TYPB	V-TRAFTBM-	V-TRAFTBM-	Type B traffic area	6	0.35	7
V-TRAF-TYPC	V-TRAFTCM-	V-TRAFTCM-	Type C traffic area	10	0.35	7
<b>Wetlands</b>						
V-WETL-BOGS	V-WETLBOM-	V-WETLBOM-	Bogs	0	0.25	6
V-WETL-FENS	V-WETLFEM-	V-WETLFEM-	Fens	0	0.25	2
V-WETL-IDEN	V-WETLIDM-	V-WETLIDM-	Wetland annotation	0	0.25	4
V-WETL-MRSH	V-WETLMRM-	V-WETLMRM-	Fresh water marshes	0	0.25	162
V-WETL-MRSH-SALT	V-WETLMSM-	V-WETLMSM-	Tidal saltwater marshes	0	0.25	33
V-WETL-MRSH-TIDL	V-WETLMTM-	V-WETLMTM-	Tidal freshwater marsh	0	0.25	162
V-WETL-PCSN	V-WETLPCM-	V-WETLPCM-	Pocosins	0	0.25	6
V-WETL-PHOL	V-WETLPHM-	V-WETLPHM-	Vernal pools, playas, prairie potholes, wet meadows, and wet prairies	0	0.25	5
V-WETL-RPRN	V-WETLRPM-	V-WETLRPM-	Riparian forested wetlands	0	0.25	162
V-WETL-SLGH	V-WETLSLM-	V-WETLSLM-	Sloughs	0	0.25	33
V-WETL-SWMP	V-WETLSWM-	V-WETLSWM-	Swamps	0	0.25	162
<b>Sections</b>						
V-SECT-IDEN	V-SECTDIM-	V-SECTDIM-	Component identification numbers	0	0.35	2
V-SECT-MBND	V-SECTMBM-	V-SECTMBM-	Material beyond section cut	0	0.18	5
V-SECT-MCUT	V-SECTMOM-	V-SECTMOM-	Material cut by section	0	0.50	4
V-SECT-PATT	V-SECTPAM-	V-SECTPAM-	Textures and hatch patterns	0	0.18	9

Note: V = Varies, NA = Not Applicable

**Discipline: Geotechnical**  
Model File Layers/Levels

Level/layer Naming		ISO Format		Level/layer Description		Graphic Details		Model File Types	
<b>General Information</b>									
B-ANNO-DIMS	B-----DIP-			Witness/extension lines, dimension terminators, dimension text		0	V	V	V
B-ANNO-KEYN	B-----KEP-			Reference keynotes with associated leader		0	V	V	V
B-ANNO-NOTE	B-----NOP-			General notes and general remarks		0	0.35	2	4
B-ANNO-NPLT	B-----NPP-			Non-plotting graphic information		0	0.18	5	1
B-ANNO-PATT	B-----PAP-			Patternning, poche, shading, and hatching		0	0.18	8	9
B-ANNO-RDME	B-----RDP-			Read-me information		0	0.18	5	1
B-ANNO-REFR	B-----REFP-			Reference files (AutoCAD users only)		NA	NA	NA	NA
B-ANNO-SYMB	B-----SYF-			Miscellaneous symbols		V	V	6	5
B-ANNO-TEXT	B-----TEP-			Miscellaneous text and callouts with associated leader		0	V	V	V
<b>Existing Conditions</b>						0	0.25	1	3
B-EXIST-BLDG	B-EXISTBLM-			Existing building		0	0.25	1	3
B-EXIST-COND	B-EXISTCM-			Existing conditions		0	0.25	1	3
<b>Geophysical Borings</b>						0	0.35	162	33
B-BORE-CONE	B-BORECM-			Cone penetrometer test location		0	0.35	162	33
B-BORE-HOLE	B-BOREHM-			Geophysical boring locations		0	0.35	162	33
B-BORE-IDEN	B-BOREIDM-			Geophysical location identification		0	0.35	2	4
B-BORE-LINE	B-BORELM-			Geophysical transect lines		0	0.50	4	7
B-BORE-PUSH	B-BOREPUM-			Direct push test location		0	0.35	162	33
B-BORE-STRK	B-BORESTM-			Geophysical strike line		0	0.35	162	33
<b>Consolidation Curve</b>						0	0.25	6	5
B-CONS-DATA	B-CONSDAM-			Consolidation curve date		0	0.25	6	5
B-CONS-DATA-TEXT	B-CONSDTM-			Consolidation curve data text		0	0.25	6	5
B-CONS-FRAM	B-CONSERM-			Consolidation curve frame		0	0.50	4	7
B-CONS-GRID	B-CONSGRM-			Consolidation curve grid		0	0.25	1	3
B-CONS-GRID-TEXT	B-CONSGTM-			Consolidation curve grid text		0	0.25	2	4
<b>Water Content</b>						0	0.25	3	2
B-H2OC-ATTB-DATA	B-H2OCADM-			Water content Afterberg limits		0	0.25	3	2
B-H2OC-ATTB-TEXT	B-H2OCATM-			Water content Afterberg limits text		0	0.25	3	2
B-H2OC-GRID-MAJR	B-H2OCGM-M			Water content major grid		0	0.25	1	3
B-H2OC-GRID-MINR	B-H2OCGM-M			Water content minor grid		1	0.18	8	9
B-H2OC-GRID-TEXT	B-H2OCGTM-			Water content grid text		0	0.25	2	4
B-H2OC-MOIS-DATA	B-H2OCMDM-M			Water content moisture content points and lines		0	0.25	6	5
B-H2OC-MOIS-TEXT	B-H2OCMTM-M			Water content moisture content text		0	0.25	6	5
<b>Joints</b>						0	0.35	12	27
B-JNTS-CNTL-LONG	B-JNTSCLM-			Construction joints - longitudinal		0	0.35	6	5
B-JNTS-CNTJ-TRAV	B-JNTSCTJM-			Construction joints - transverse		0	0.35	6	5
B-JNTS-CTRJ-LONG	B-JNTSTLM-			Contraction joints - longitudinal		0	0.35	2	4
B-JNTS-CTRJ-TRAV	B-JNTSTM-			Contraction joints - transverse		0	0.35	2	4
B-JNTS-EDGE	B-JNTSEDJM-			Thickened edges		0	2.00	4	7
B-JNTS-EXPJ	B-JNTSEXM-			Expansion joints		0	0.35	12	27
<b>Logs</b>						0	0.25	3	2
B-LOGS-FDTA	B-LOGSFDM-			Field data		0	V	V	V
B-LOGS-FORM	B-LOGSFOM-			Bore log form		0	0.50	4	7
B-LOGS-FRAM	B-LOGSFRM-			Frame for boring log and associated test date		0	0.25	2	4
B-LOGS-TEXT	B-LOGSFTM-			Text associated with boring log frame		0	0.25	1	3
B-LOGS-LDTA	B-LOGSLDM-			Laboratory data		0	0.25	1	3

**Discipline: Geotechnical**  
Model File Layers/Levels

Level/layer Naming		ISO Format		Level/layer Description		Graphic Details		Model File Types	
		B-LLOGSPATT	B-LLOGSPATT-	Soil/rock patterns		Line Style	Line Width (mm)	MicroStation Color #	AutoCAD Color #
<b>Normal Stress</b>		B-NORM-DATA	B-NORMIDM-	Normal stress data		0	0.18	8	9
		B-NORM-DATA-TEXT	B-NORMIDM-	Normal stress data text		0	0.25	6	5
		B-NORM-GRID-MAJR	B-NORMIGRM-	Normal stress major grid		0	0.25	6	5
		B-NORM-GRID-MINR	B-NORMIGRM-	Normal stress minor grid		0	0.25	1	3
		B-NORM-GRID-TEXT	B-NORMIGTM-	Normal stress grid text		1	0.18	8	9
<b>Plasticity Chart</b>		B-PLAS-DATA	B-PLASDAM-	Plasticity chart date		0	0.25	6	5
		B-PLAS-DATA-TEXT	B-PLASDAM-	Plasticity chart data text		0	0.25	6	5
		B-PLAS-FRAM	B-PLASFRM-	Plasticity chart frame		0	0.50	4	7
		B-PLAS-GRID	B-PLASGRM-	Plasticity chart grid		0	0.50	2	4
		B-PLAS-GRID-TEXT	B-PLASGTM-	Plasticity chart grid text		0	0.25	2	4
<b>Pavements</b>		B-PVMT-WISM	B-PVMTWIM-	Mismatched pavement joint		0	0.35	6	5
		B-PVMT-OTLN-AGSC	B-PVMTOTAM-	Outline - aggregate surface coarse and grave		0	0.35	195	13
		B-PVMT-OTLN-FLEX	B-PVMTOTM-	Outline - flexible pavement		0	0.35	6	5
		B-PVMT-OTLN-RIGD	B-PVMTOTR-	Outline - rigid pavement		0	0.35	2	4
		B-PVMT-PAIT-AGSC	B-PVMTPATM-	Pattern - aggregate surface coarse and grave		0	0.18	8	9
		B-PVMT-PAIT-FLEX	B-PVMTPFTM-	Pattern - flexible pavement		0	0.18	8	9
		B-PVMT-PAIT-RIGD	B-PVMTPFRM-	Pattern - rigid pavement		0	0.18	8	9
		B-PVMT-REIN	B-PVMTREM-	Reinforced pavement		0	0.35	6	5
<b>Sample Locations</b>		B-SAMP-AUGR	B-SAMPALM-	Auger sample location		0	0.35	17	67
		B-SAMP-CORE	B-SAMPCCM-	Core sample location		0	0.35	17	67
		B-SAMP-DRIVE	B-SAMPDRM-	Drive sample (shelby, split spoon) location		0	0.35	17	67
		B-SAMP-GRAB	B-SAMPGRM-	Grab sample location		0	0.35	17	67
		B-SAMP-IDEN	B-SAMPIDM-	Sample location identification		0	0.35	2	4
		B-SAMP-PERC	B-SAMPPERM-	Percolation test hole		0	0.50	83	42
		B-SAMP-PITS	B-SAMPPIM-	Test pit sample location		0	0.50	83	42
		B-SAMP-VERT	B-SAMPVERM-	Vertical core hole location		0	0.35	122	23
		B-SAMP-WASH	B-SAMPWAM-	Wash bored hole location		0	0.35	122	23
<b>Shear Strength vs. Normal Stress</b>		B-SSNS-DATA	B-SSNSDAM-	Shear strength vs. normal stress data		0	0.25	6	5
		B-SSNS-TEXT	B-SSNSDTM-	Shear strength vs. normal stress data text		0	0.25	6	5
		B-SSNS-FRAM	B-SSNSFRM-	Shear strength vs. normal stress frame		0	0.50	4	7
		B-SSNS-GRID	B-SSNSGRM-	Shear strength vs. normal stress grid		0	0.25	1	3
		B-SSNS-GRID-TEXT	B-SSNSGTM-	Shear strength vs. normal stress grid text		0	0.50	2	4
<b>Shear Strength</b>		B-SSTR-1TST-DATA	B-SSTR1DM-	Shear strength 1 Point Q test data		0	0.25	4	7
		B-SSTR-1TST-TEXT	B-SSTR1TTM-	Shear strength 1 Point Q test text		0	0.25	4	7
		B-SSTR-GRID-MAJR	B-SSTRGRM-	Shear strength major grid		0	0.25	1	3
		B-SSTR-GRID-MINR	B-SSTRGTM-	Shear strength minor grid		1	0.18	8	9
		B-SSTR-GRID-TEXT	B-SSTRGTM-	Shear strength grid text		0	0.25	2	4
		B-SSTR-Q1T-DATA	B-SSTRQDM-	Shear strength Q test data		0	0.25	6	5
		B-SSTR-Q1T-TEXT	B-SSTRQTM-	Shear strength Q test text		0	0.25	6	5
		B-SSTR-R1T-DATA	B-SSTRRDMM-	Shear strength R test data		0	0.25	2	4

**Discipline: Geotechnical**  
Model File Layers/Levels

Level/layer Naming		ISO Format	Level/Layer Description	Model File Types					
				Graphic Defaults			Details		
			Line Style	Line Width (mm)	MicroStation Color #	AutoCAD Color #	Subsurface Investigation Plan	Joint Layout Plan *	Pavelement Site Plan
B-SSTR-R-TEST-TEXT	B-SSTR-RTT-TEXT	B-SSTRRTM-	Shear strength R test (ex)	0	0.25	2	4		
B-SSTR-STST-DATA	B-SSTRSSTDATA	B-SSTRSDM-	Shear strength S test data	0	0.25	5	1		
B-SSTR-STST-TEXT	B-SSTRSTTEXT	B-SSTRSTM-	Shear strength S test (ex)	0	0.25	5	1		
B-SSTR-STUT-DATA	B-SSTRSTUDATA	B-SSTRUDM-	Shear strength UCT test data	0	0.25	3	2		
B-SSTR-UTST-TEXT	B-SSTRUTTEXT	B-SSTRUTM-	Shear strength UCT test (ex)	0	0.25	3	2		
B-SSTR-VIST-DATA	B-SSTRVISTDATA	B-SSTRVDM-	Shear strength Vane shear test data	0	0.25	7	0		
B-SSTR-VIST-TEXT	B-SSTRVISTTEXT	B-SSTRVTM-	Shear strength Vane shear (ex)	0	0.25	7	0		
<b>Tabular Test</b>									
B-TABT-DATA	B-TABT-TEXT	B-TABTDAM-	Tabular test data	0	0.25	6	5	X	
B-TABT-DATA-TEXT	B-TABTTEXT	B-TABTDTM-	Tabular test data (ex)	0	0.25	6	5	X	
B-TABT-FRAM	B-TABTFRAM	B-TABTFRM-	Tabular test data frame	0	0.50	4	1	X	
B-TABT-GRID	B-TABTGRID	B-TABTGRM-	Tabular test data grid	0	0.25	1	3	X	
B-TABT-GRID-TEXT	B-TABTGRIDTEXT	B-TABTGTM-	Tabular test data grid (ex)	0	V	2	4	X	
<b>Wells</b>									
B-WELL-ASR~	B-WELLASR~	B-WELLASM-	ASR wells	0	0.35	82	18	X	
B-WELL-MONT	B-WELLMONT	B-WELLMOM-	Monitoring wells	0	0.35	82	18	X	
B-WELL-PIZO	B-SAMPPIZ	B-SAMPPIM-	Piezometers	0	0.35	82	18	X	
<b>Wet Density</b>									
B-WETD-DATA	B-WETDDATA	B-WETDDAM-	Wet density data	0	0.25	6	5	X	
B-WETD-DATA-TEXT	B-WETDDATATEXT	B-WETDDDTM-	Wet density data (ex)	0	0.25	6	5	X	
B-WETD-GRID-MAJR	B-WETDGMJR	B-WETDGM-	Wet density major grid	0	0.25	1	3	X	
B-WETD-GRID-MINR	B-WETDGMNR	B-WETDGM-	Wet density minor grid	1	0.18	8	9	X	
B-WETD-GRID-TEXT	B-WETDGTTEXT	B-WETDGTM-	Wet density grid (ex)	0	0.25	2	4	X	
<b>Sections</b>									
B-SECT-IDEN	B-SECTIDEN	B-SECTIDM-	Component identification numbers	0	0.35	2	4	X	
B-SECT-MBND	B-SECTMBND	B-SECTMBM-	Material beyond section cut	0	0.18	5	1	X	
B-SECT-MCUT	B-SECTMCUT	B-SECTMOM-	Material cut by section	V	V	V	V	X	
B-SECT-PATT	B-SECTPATT	B-SECTPAM-	Textures and hatch patterns	0	0.18	8	9	X	
B-SECT-SLOG	B-SECTSLOG	B-SECTSJM-	Stick log graphics	0	0.35	3	2	X	
<b>Detail Information</b>									
B-DETL-GRPH	B-DETLGRPH	B-DETLGRM-	Graphics, gridlines, non-text items	V	V	V	V	X	
B-DETL-INPD	B-DETLINPD	B-DETLINM-	Inch-pound specific dimensions and notes	V	V	V	V	X	
B-DETL-METR	B-DETLMETR	B-DETMEM-	Metric specific dimensions and notes	V	V	V	V	X	

Note: V = Varies, NA = Not Applicable

\* = Check to see if a Civil Joint Layout Plan has been developed, to avoid duplication

**Discipline: Civil**  
Model File Layers/Levels

Level/Layer Naming		ISO Format	Level/Layer Description	Model File Types			
				Graphic Defaults	Autodesk Color #	MicroStation Color #	Line Style
<b>General Information</b>				0	V	V	
C-ANNO-DIMS	C----DIP-	Witness/extension lines, dimension terminators, dimension text		0	V	V	
C-ANNO-KEYN	C----KEP-	Reference keynotes with associated leaders		0	V	V	
C-ANNO-MASK	C----MAP-	Text/shape mask for use with photo backgrounds		0	0.18	113	
C-ANNO-NOTE	C----NOP-	General notes and general remarks		0	0.35	2	
C-ANNO-NPLT	C----NPP-	Non-printing graphic information		0	0.18	5	
C-ANNO-PATT	C----PAP-	Patterning, poche, shading, and hatching		V	0.18	8	
C-ANNO-RDME	C----RDP-	Read-me information		0	0.18	5	
C-ANNO-REFR	C----SYP-	Reference files (AutoCAD users only)		NA	NA	NA	
C-ANNO-SYMB	C----SYB-	Miscellaneous symbols		V	0.18	5	
C-ANNO-TEXT	C----TEP-	Miscellaneous text and callouts with associated leaders		0	V	V	
<b>Alignments</b>				0	0.35	3	
C-ALIGN-DATA	C-ALGN-DM	Alignment coordinates and curve data		4	0.35	2	
C-ALIGN-LINE	C-ALGN-LIM-	Alignments		0	0.35	1	
C-ALIGN-MAIR	C-ALGN-MAIR	Alignment major stationing and tick marks		0	0.35	3	
C-ALIGN-MARK	C-ALGN-MAM-	Alignment tick marks		0	0.18	6	
C-ALIGN-MINR	C-ALGN-MINM-	Alignment minor stationing and tick marks		0	0.35	3	
C-ALIGN-STAT	C-ALGN-STAM-	Alignment stationing and tick marks, alignment PI stations		0	0.35	3	
C-ALIGN-SYMB	C-ALGN-SYMB	Alignment symbols (PIs)		0	0.35	6	
C-ALIGN-TEXT	C-ALGN-TEM-	Alignment text, annotation with associated leaders		0	0.35	2	
<b>Aprons</b>				7	0.35	1	
C-APRN-CNTR	C-APRNCTM-	Apron centerlines		0	0.35	2	
C-APRN-CNTR-IDEN	C-APRNCTM-IDEN	Apron centerline annotation		0	0.35	2	
C-APRN-GRND	C-APRNGRM-	Grounding points		0	0.35	2	
C-APRN-HOLD	C-APRNHDIM-	Holding position markings		0	0.25	1	
C-APRN-IDEN	C-APRNIDM-	Airfield apron - annotation		0	0.35	2	
C-APRN-MOOR	C-APRNMMOM-	Mooring points		0	0.35	2	
C-APRN-MRKG	C-APRNMRKM-	Apron markings		0	0.50	4	
C-APRN-OTLN	C-APRNOTM-	Airfield apron - outlines		0	0.50	4	
C-APRN-SECU	C-APRNSEM-	Security zone markings		0	0.25	1	
C-APRN-SHLD	C-APRNSHWM-	Shoulders with annotation		0	0.35	2	
C-APRN-SHLD-MRKG	C-APRNSHMW-	Shoulder stripes		0	0.35	2	
<b>Beach Renourishment</b>				0	0.25	6	
C-BECH-BANK-TOP~	C-BECHBTM-	Beach top of bank		2	0.35	5	
C-BECH-BKN	C-BECHBKM-	Beach breaking		0	0.50	4	
C-BECH-BLIN	C-BECHBLM-	Beach baseline and control line		0	0.25	4	
C-BECH-BLIN-IDEN	C-BECHBLIDEN	Beach baseline and control line annotation		0	0.35	22	
C-BECH-BNCH	C-BECHBNM-	Beach bench		6	0.35	5	
C-BECH-CNTR	C-BECHCNM-	Beach centline		7	0.25	5	
C-BECH-CNTR-IDEN	C-BECHCNDEN	Beach centline annotation		0	0.25	6	
C-BECH-ELIN	C-BECHELM-	Beach erosion control line		0	0.25	4	
C-BECH-EUIN-IDEN	C-BECHEUDEN	Beach erosion control line annotation		0	0.25	6	
C-BECH-LIMT	C-BECHLIM-	Beach limit lines		0	0.50	4	
C-BECH-OHWM	C-BECHOHM-	Ordinary high water marks		0	0.35	2	
C-BECH-OTLN	C-BECHOTM-	Beach outline		0	0.25	2	
C-BECH-SLOP-IDEN	C-BECHSMDEN	Beach slope indicator with annotation		0	0.25	7	
C-BECH-SLOP-TOP~	C-BECHSMTM-	Beach top of slope		2	0.35	22	
C-BECH-SYMB	C-BECHSYM-	Beach symbols		0	0.18	6	
C-BECH-TOE~	C-BECHTOM-	Beach toe		3	0.50	5	
C-BECH-TOE-IDEN	C-BECHTOMIDEN	Beach toe annotation		0	0.25	7	
<b>Buildings and Primary Structures</b>				0	0.50	4	
C-BLDG-DECK	C-BLDGDEM	Outdoor decks (attached, no roof overhead)		0	0.50	4	
C-BLDG-DOCK	C-BLDGDOM	Loading docks		0	0.50	4	

Appendix A Model File Level/Layer Tables

**Discipline: Civil**  
Model File Layers/Levels

Level/Layer Naming		Model File Types									
		Graphic Defaults					Details				
		Line Style	AutoCAD Color #	Microsoft Station Color #	Line Width (mm)	AutoCAD Color #	Microsoft Station Color #	Line Width (mm)	AutoCAD Color #	Microsoft Station Color #	Line Width (mm)
<b>AIA Format</b>	<b>ISO Format</b>	Level/layer Description									
C-BLDG-IDEN	C-BLDGIDM-	Building and other structure annotation	0	0.35	2	4					
C-BLDG-OTLN	C-BLDGOTM-	Building and other structure outlines	0	0.70	7	0					
C-BLDG-OVHD	C-BLDGOM-	Building overhangs	0	0.50	4	7					
C-BLDG-PRCH	C-BLDGPRM-	Porches (attached, roof overhead)	0	0.50	4	7					
<b>Borrow Areas</b>	<b>C-BORW-IDEN</b>	<b>C-BORWMF-</b> Borrow/spoil area annotation	0	0.35	2	4					
	<b>C-BORW-LINE</b>	<b>C-BORWLNM-</b> Borrow/spoil area	2	0.35	2	4					
<b>Bridges</b>	<b>C-BRDG-CHRD-LOW</b>	<b>C-BRDGCLM-</b> Low chord	0	0.50	4	7					
	<b>C-BRDG-CNTR</b>	<b>C-BRDGCNM-</b> Bridge centerlines	7	0.25	1	3					
	<b>C-BRDG-CTLJ</b>	<b>C-BRDGCTM-</b> Control joints	0	0.25	4	7					
	<b>C-BRDG-DECK</b>	<b>C-BRDGDEM-</b> Bridge deck	0	0.35	4	7					
	<b>C-BRDG-IDEN</b>	<b>C-BRDGIDM-</b> Bridge annotation	0	0.35	2	4					
	<b>C-BRDG-OTLN</b>	<b>C-BRDGOTM-</b> Bridge outlines	0	0.50	4	7					
	<b>C-BRDG-RAIL</b>	<b>C-BRDGRAM-</b> Bridge railing	0	0.25	4	7					
<b>Channels</b>	<b>C-CHAN-BANK-IDEN</b>	<b>C-CHANBIM-</b> Channel/canal top of bank annotation	0	0.35	2	4					
	<b>C-CHAN-BANK-TOP-</b>	<b>C-CHANBTM-</b> Channel/canal top of bank	0	0.35	2	4					
	<b>C-CHAN-BNCH</b>	<b>C-CHANBNM-</b> Channel/canal bench design feature lines (breaklines from DTMs)	0	0.35	2	4					
	<b>C-CHAN-BWTR</b>	<b>C-CHANBWM-</b> Breakwaters	0	0.35	6	5					
	<b>C-CHAN-CNTR</b>	<b>C-CHANCNM-</b> Channel centerline and survey report lines	7	0.18	5	1					
	<b>C-CHAN-CNTR-IDEN</b>	<b>C-CHANCNM-</b> Channel centerline and survey report lines - annotation	0	0.35	5	1					
	<b>C-CHAN-DACL</b>	<b>C-CHANDAM-</b> De-authorized channel limits, anchorages, etc.	0	0.35	3	2					
	<b>C-CHAN-DACL-IDEN</b>	<b>C-CHANDIM-</b> De-authorized channel limits, anchorages, etc. - annotation	0	0.35	3	2					
	<b>C-CHAN-DOCK</b>	<b>C-CHANLIM-</b> Docks, decks, floats, piers, and mooring facilities	0	0.35	6	5					
	<b>C-CHAN-LIMIT</b>	<b>C-CHANLIM-</b> Channel limits, anchorages, turning basins, disposal areas, etc.	0	0.35	6	5					
	<b>C-CHAN-IMT-IDEN</b>	<b>C-CHANLDM-</b> Channel limits, anchorages, turning basins, disposal areas, etc. - annotation	0	0.35	6	5					
	<b>C-CHAN-NAID</b>	<b>C-CHANNAIM-</b> Navigation aids and text	0	0.35	5	V					
	<b>C-CHAN-SLOP-LINE</b>	<b>C-CHANSLM-</b> Channel cut/fill slope (indicates cut and fill lines)	0	0.35	2	4					
	<b>C-CHAN-SPOL</b>	<b>C-CHANSPM-</b> Spoil limits	0	0.50	4	7					
	<b>C-CHAN-SYMB</b>	<b>C-CHANSTM-</b> Channel/canal symbol	0	0.35	6	5					
	<b>C-CHAN-TEXT</b>	<b>C-CHANTEM-</b> Channel/canal text, annotation with associated leaders	0	0.35	2	4					
	<b>C-CHAN-TOE-</b>	<b>C-CHANTOIM-</b> Channel/canal toe	3	0.50	5	1					
	<b>C-CHAN-TOE--IDEN</b>	<b>C-CHANTOIM-</b> Channel/canal toe annotation	0	0.35	6	5					
	<b>C-CHAN-TURN</b>	<b>C-CHANTRIM-</b> Turning points	0	0.35	2	4					
	<b>C-CHAN-WIDE</b>	<b>C-CHANWDM-</b> Channel/canal widening	3	0.50	4	7					
<b>Domestic Water</b>	<b>C-DOMW-ASND-PIPE</b>	<b>C-DOMWAPM-</b> Abandoned piping	2	0.35	6	5					
	<b>C-DOMW-DEV</b>	<b>C-DOMWDEM-</b> Connectors, faucets, reducers, regulators, vents, intake points, taps, backflow preventers, and valves	0	0.35	6	5					
	<b>C-DOMW-FIRE</b>	<b>C-DOMWFIM-</b> Fire lines	FIRE	0.35	1	3					
	<b>C-DOMW-FTFG</b>	<b>C-DOMWFTM-</b> Caps, cleaouts, crosses, and tees	0	0.35	6	5					
	<b>C-DOMW-HYDR</b>	<b>C-DOMWHYHM-</b> Hydrants	0	0.35	1	3					
	<b>C-DOMW-IDEN</b>	<b>C-DOMWIDM-</b> Identifier tags, symbol modifier, and text	0	0.35	2	4					
	<b>C-DOMW-MAIN-PIPE</b>	<b>C-DOMWMPM-</b> Main domestic water piping	WATER	0.35	6	5					
	<b>C-DOMW-METR</b>	<b>C-DOMWMEM-</b> Meters	0	0.35	3	2					
	<b>C-DOMW-NFOT-HYDR</b>	<b>C-DOMWNHPM-</b> Non-potable hydrants/flushing hydrants	NONPOT	0.35	1	3					
	<b>C-DOMW-NPOT-PIPE</b>	<b>C-DOMWNPMPM-</b> Non-potable water piping	0	0.35	6	5					
	<b>C-DOMW-PITS-IDEN</b>	<b>C-DOMWPIM-</b> Identifier tags, symbol modifier, and text	0	0.35	3	2					
	<b>C-DOMW-PITS-VENT</b>	<b>C-DOMWPVM-</b> Vent pits	0	0.35	3	2					
	<b>C-DOMW-PITS-VLVE</b>	<b>C-DOMWPVLV-</b> Valve pits/vaults	0	0.35	3	2					
	<b>C-DOMW-SERV-PIPE</b>	<b>C-DOMWSPM-</b> Domestic water service piping	0	0.35	6	5					
	<b>C-DOMW-SIGN</b>	<b>C-DOMWSGM-</b> Surface markers/signs	0	0.35	1	3					

**Discipline: Civil**  
Model File Layers/Levels

Level/Layer Naming		Graphic Defaults		Model File Types	
<b>AIA Format</b>	ISO Format	Level/Layer Description			
C-DOMW-STNS-IDEN	C-DOMWSIM-	Identifier tags, symbol modifier, and text	0	0.35	2
C-DRED-LIMIT	C-DREDIM-	Dredging annotation	0	0.35	2
C-DRED-ORHWM	C-DREODIM-	Dredge limit lines	0	0.50	4
<b>Ditches or Washes</b>		Ordinary high water marks	0	0.35	2
C-DTCH-BOTC	C-DTCHBOM-	Bottom of ditch or wash	0	0.25	3
C-DTCH-CNTR	C-DTCHCNW-	Centerline of ditch or wash	0	0.18	5
C-DTCH-EWAT	C-DTCHEWM-	Edge of water	0	0.25	4
C-DTCH-IDEN	C-DTCHIDM-	Habitat annotation	0	0.35	3
C-DTCH-TOP-	C-DTCHTOM-	Ditches and washes annotation	0	0.25	3
<b>Habitats/Landforms</b>		Top of ditch or wash	0	0.25	3
C-ECCO-BURR	C-ECCOBUM-	Burrow	0	0.50	4
C-ECCO-DENS	C-ECCODEM-	Den	0	0.50	4
C-ECCO-GATR	C-ECCOGAM-	Gator hole	2	0.35	6
C-ECCO-HUMK	C-ECCOHUM-	Hummocks	0	0.35	6
C-ECCO-IDEN	C-ECCOIDM-	Habitat annotation	0	0.35	2
C-ECCON-NEST	C-ECCONEM-	Nest, nesting tree	0	0.50	4
C-ECCO-PRCH	C-ECCOPRM-	Perch/nesting hole	0	0.50	4
<b>Erosion and Sediment Control (Temporary/Construction</b>					
C-EROS-CIPR	C-EROSCIM-	Culvert/inlet protection	V	0.25	3
C-EROS-CNTE	C-EROSCNM-	Construction entrance	V	0.35	6
C-EROS-DDIV	C-EROSDDM-	Drainage divides	0	0.50	4
C-EROS-DVDK	C-EROSDVM-	Diversion dike	0	0.50	4
C-EROS-IDEN	C-EROSIDM-	Erosion and sediment control annotation	0	0.35	3
C-EROS-INPR	C-EROSINM-	Inlet protection	V	0.25	3
C-EROS-SILT	C-EROSISM-	Silt fence	SILT	0.35	2
C-EROS-SILT-CHCK	C-EROSSM-	Silt check	0	0.35	2
C-EROS-SILT-TRAP	C-EROSSTM-	Silt trap	0	0.35	2
C-EROS-SSLT	C-EROSSSM-	Super silt fence	SSLT	0.35	2
<b>Flood Hazard Area</b>					
C-FLHA-025Y	C-FLHA25M-	25 year mark	6	0.35	6
C-FLHA-050Y	C-FLHA50M-	50 year mark	3	0.35	2
C-FLHA-100Y	C-FLHA10M-	100 year mark	0	0.35	6
C-FLHA-200Y	C-FLHA20M-	200 year mark	2	0.35	2
C-FLHA-500Y	C-FLHA50M-	500 year mark	7	0.35	6
C-FLHA-IDEN	C-FLHAIDM-	Flood hazard area annotation	0	0.35	2
<b>Floodwalls</b>					
C-FLOD-BASE	C-FLODBAM-	Floodwall base of wall	0	0.50	20
C-FLOD-BASE-IDEN	C-FLODBIM-	Floodwall base of wall annotation	0	0.35	20
C-FLOD-CNTR	C-FLODCNM-	Floodwall centerline	7	0.18	20
C-FLOD-CNTR-IDEN	C-FLODCIM-	Floodwall centerline annotation	0	0.35	20
C-FLOD-DRAN	C-FLODDIM-	Floodwall toe drain	0	0.35	6
C-FLOD-DRAN-IDEN	C-FLODDIM-	Floodwall toe drain annotation	0	0.35	6
C-FLOD-PILE	C-FLODPIM-	Floodwall sheet piling	0	0.50	22
C-FLOD-PILE-IDEN	C-FLODPIM-	Floodwall sheet piling annotation	0	0.50	22
C-FLOD-TOE-	C-FLODTOM-	Floodwall toe outline	0	0.35	4
C-FLOD-TOE-	C-FLODTPM-	Floodwall top of wall	0	0.50	4
C-FLOD-TOE-IDEN	C-FLODTTM-	Floodwall top of wall annotation	0	0.35	20

**Discipline: Civil**  
Model File Layers/Levels

Level/Layer Naming		ISO Format	Level/Layer Description	Graphic Defaults		Model File Types	
AIA Format	AutoCAD Color #	Line Style	MicroStation Color #	Line Width (mm)	Autodesk Color #	Details	
<b>Liquid Fuel</b>							
C-FUEL-ABND-PIPE	C-FUELAPM-	Abandoned piping	2	0.35	6	5	
C-FUEL-BERM	C-FUELBNM-	Berms for retaining fuel in case of major tank/line rupture	0	0.35	6	5	
C-FUEL-DEFL-PIPE	C-FUELDPM-	Defueling piping	0	0.35	6	5	
C-FUEL-DEV/C	C-FUELAEM-	Air eliminators, filter strainers, hydrant fill points, line vents, markers, oil/water separators, reducers, regulators, and valves	0	0.35	6	5	
C-FUEL-FLOW	C-FUELFLM-	Flow direction arrows	0	0.35	6	5	
C-FUEL-LFTIC	C-FUELFTM-	Caps, crosses, and tees	0	0.35	6	5	
C-FUEL-IDEN	C-FUELIDM-	Identifier tags, symbol modifier, and text	0	0.35	2	4	
C-FUEL-JBOX	C-FUELJBM-	Junction boxes, manholes, handholes, test boxes	0	0.35	1	3	
C-FUEL-MAIN-PIPE	C-FUELMPM-	Main fuel piping	0	0.35	6	5	
C-FUEL-METR	C-FUELMPM-	Meters	0	0.35	3	2	
C-FUEL-PITS-HYDR	C-FUELPHM-	Hydrant control pits	0	0.35	3	2	
C-FUEL-PITS-IDEN	C-FUELPM-	Identifier tags, symbol modifier, and text	0	0.35	3	2	
C-FUEL-PITS-VENT	C-FUELPMW-	Vent pits	0	0.35	3	2	
C-FUEL-PITS-VLVE	C-FUELPM-	Valve pits	0	0.35	3	2	
C-FUEL-SERV-PIPE	C-FUELSPM-	Service piping	0	0.35	6	5	
C-FUEL-STNS-IDEN	C-FUELSIM-	Identifier tags, symbol modifier, and text	0	0.35	2	4	
C-FUEL-STNS-PUMP	C-FUELSUM-	Booster pump stations	0	0.35	6	5	
C-FUEL-TANK	C-FUELTM-	Fuel tanks	0	0.35	3	2	
C-FUEL-TRCH	C-FUELTRM-	Fuel line trench	0	0.35	3	2	
<b>Grade</b>							
C-GRAD-ALLOW	C-GRADALM-	Allowable cover depth	0	0.35	6	5	
C-GRAD-BNCH	C-GRADBPNP-	Bench cut	0	0.35	6	5	
C-GRAD-DSGN	C-GRADDSM-	Design grade (proposed)	0	0.35	3	2	
C-GRAD-EXCV	C-GRADECP-	Excavation grade	0	0.50	4	7	
C-GRAD-EXIST	C-GRADEXM-	Existing grade, ground line	3	0.35	6	5	
C-GRAD-FNNSH	C-GRADFNW-	Finished grade	0	0.35	4	7	
C-GRAD-FNNSH-PRP1	C-GRADFM-	Proposed Surface #1	0	0.35	8	9	
C-GRAD-FNNSH-PRP2	C-GRADFM-	Proposed Surface #2	0	0.35	8	9	
C-GRAD-FNNSH-PRP3	C-GRADFM-	Proposed Surface #3	0	0.35	8	9	
C-GRAD-FNNSH-PRP4	C-GRADFM-	Proposed Surface #4	0	0.35	8	9	
C-GRAD-GTBL	C-GRADGTP-	Geotextile placement grade	0	0.25	1	3	
C-GRAD-IDEN	C-GRADIDM-	Grade annotation for cross sections and profiles	0	0.35	2	4	
C-GRAD-REQD	C-GRADSCM-	Required depth	0	0.35	6	5	
C-GRAD-SCLN	C-GRADSCM-	Stability control line	7	0.50	5	1	
C-GRAD-WATR	C-GRADWAP-	Water surface in section view	0	0.35	2	4	
<b>Grid Lines</b>							
C-GRID-FRAM	C-GRIDFRM-	Frame	0	0.50	4	7	
C-GRID-MAIR	C-GRIDMAM-	Major grid lines	1	0.35	8	9	
C-GRID-MINR	C-GRIDMM-	Minor grid lines	1	0.35	2	4	
C-GRID-TEXT	C-GRIDTEM-	Border text, annotation					
<b>Helipads</b>							
C-HELI-BLST	C-HELIBLM-	Blast pad and stopway markings	0	0.35	1	3	
C-HELI-CNTR	C-HELCNM-	Centerline markings	0	0.35	1	3	
C-HELI-DISP	C-HELDSM-	Displaced threshold markings	0	0.35	1	3	
C-HELI-DIST	C-HELDIM-	Fixed distance markings	0	0.35	1	3	
C-HELI-IDEN	C-HELIDM-	Helipad numbers and letters	0	0.35	2	4	
C-HELI-SHLD	C-HELISHM-	Shoulder markings	0	0.35	6	5	
C-HELI-SIDE	C-HELISIM-	Side stripes	0	0.50	4	7	
C-HELI-TDZN	C-HELTDM-	Touchdown zone markers	0	0.35	6	5	
C-HELI-THRS	C-HELITHM-	Threshold markers	0	0.35	6	5	
<b>Industrial Waste Water</b>							

**Discipline: Civil**  
Model File Layers/Levels

Level/Layer Naming		Model File Types		
		Graphic Defaults		
		Line Style	MicroStation Color #	AutoCAD Color #
<b>AIA Format</b>	<b>ISO Format</b>	Level/layer Description		
C-INDW-ABND-PIPE	C-INDWAPM-	Abandoned piping	2	0.35
C-INDW-DEV-C	C-INDWDEM-	Grit chambers, meters, flumes, neutralizers, oil/water separators, ejectors, tanks, and valves	0	0.35
C-INDW-FLOW	C-INDWFLEM-	Flow direction arrows	0	0.35
C-INDW-FITG	C-INDWFITM-	Caps and cleanouts	0	0.35
C-INDW-IDEN	C-INDWIDM-	Identifier tags, symbol modifier, and text	0	0.35
C-INDW-JBOX	C-INDWJBM-	Junction boxes and manholes	0	0.35
C-INDW-LAGN	C-INDWLAM-	Lagoons	0	0.35
C-INDW-MAIN-IDEN	C-INDWMIDEN-	Identifier tags, symbol modifier, and text	0	0.35
C-INDW-MAIN-PIPE	C-INDWMPM-	Main industrial waste water piping	0	0.35
C-INDW-PLNT	C-INDWPMLM-	Treatment plants	0	0.35
C-INDW-SERV-PIPE	C-INDWSPM-	Industrial waste water service piping	0	0.35
C-INDW-SIGN	C-INDWSGM-	Surface markers/signs	0	0.35
C-INDW-STNS-IDEN	C-INDWSM-	Identifier tags, symbol modifier, and text	0	0.35
C-INDW-STNS-LIFT	C-INDWSLM-	Lift stations	0	0.35
<b>Irrigation</b>				
C-IRRG-EQPM	C-IRRGEM-	Irrigation equipment (e.g., controllers, valves, etc.)	0	0.35
C-IRRG-IDEN	C-IRRGIDM-	Irrigation annotation	0	0.35
C-IRRG-PIPE	C-IRRGIPM-	Irrigation piping	0	0.35
C-IRRG-WELL	C-IRRGWEM-	Irrigation wells	0	0.25
<b>Joints</b>				
C-JNTS-CNSL	C-JNTSSM-	Construction joints - longitudinal	0	0.35
C-JNTS-CNST	C-JNTSTM-	Construction joints - transverse	0	0.35
C-JNTS-CNTL	C-JNTSTM-	Contraction joints - longitudinal	0	0.35
C-JNTS-CNTT	C-JNTSTM-	Contraction joints - transverse	0	0.35
C-JNTS-EDGE	C-JNTSEDIM-	Thickened edges	0	0.35
C-JNTS-EXPN	C-JNTSESM-	Expansion joints	0	0.35
C-JNTS-IDEN	C-JNTSIDM-	Joint annotation	0	0.35
<b>Levees</b>				
C-LEVE-BANK-IDEN	C-LEVEBIP-	Levee top of bank annotation	0	0.25
C-LEVE-BANK-TOP~	C-LEVEBTM-	Levee top of bank	0	0.35
C-LEVE-BERM	C-LEVEBRM-	Levee berm outline	0	0.35
C-LEVE-BNCH	C-LEVEBNEM-	Levee bench design feature lines (breaklines from DTMs)	0	0.35
C-LEVE-BNCH-IDEN	C-LEVEBNIM-	Levee bench annotation	0	0.35
C-LEVE-BRWR	C-LEVEBRM-	Borrow limits	0	0.50
C-LEVE-CNTR	C-LEVECNM-	Levee centerline	7	0.18
C-LEVE-CNTRIDEN	C-LEVECIM-	Levee centerline annotation	0	0.35
C-LEVE-IDEN	C-LEVEIDM-	Levee annotation	0	0.35
C-LEVE-OTLN	C-LEVEOTM-	Levee outline	0	0.50
C-LEVE-SLOP	C-LEVESEM-	Levee slope indicator with annotation	0	0.35
C-LEVE-STAT	C-LEVESTM-	Levee stationing	0	0.35
C-LEVE-TOE-	C-LEVETOTM-	Levee toe	2	0.35
C-LEVE-TOE-IDEN	C-LEVETIM-	Levee toe annotation	0	0.25
<b>Military Ranges</b>				
C-MILR-BATP	C-MILRBAM-	Battle positions	0	0.50
C-MILR-CAMS	C-MILRCAM-	Range cameras	0	0.35
C-MILR-FOXH	C-MILRFOM-	Fox holes and pits	0	0.35
C-MILR-MATS	C-MILRMAM-	Moving army targets	0	0.50
C-MILR-MUTS	C-MILRMIM-	Moving infantry targets	0	0.50
C-MILR-MTS-IDEN	C-MILRMDIM-	Pop up targets	0	0.35
C-MILR-PUTS	C-MILRPUM-	Pop up targets annotation	0	0.50
C-MILR-PUTS-IDEN	C-MILRPIM-	Stationary army targets	0	0.35
C-MILR-SATS	C-MILRSAM-	Stationary targets	0	0.50

**Discipline: Civil**  
Model File Layers/Levels

Level/Layer Naming		Graphic Defaults		Model File Types	
		Line Style	MicroStation Color #	AutoCAD Color #	Line Width (mm)
<b>AIA Format</b>	<b>ISO Format</b>	<b>Level/Layer Description</b>			
C-MILR-SATS-IDEN	C-MILRSBM-	Stationary army targets annotation	0	0.35	2
C-MILR-SITS	C-MILRSBM-	Stationary infantry targets	0	0.35	4
C-MILR-STTS-IDEN	C-MILRSBM-	Stationary infantry targets annotation	0	0.35	2
<b>Natural Gas</b>					
C-NGAS-ABND-PIPE	C-NGASAPNM-	Abandoned piping	2	0.35	6
C-NGAS-DEV/C	C-NGASDEM-	Hydrant fill points, lights, vents, markers, reducers, regulators, sources, drip pots, taps, and valves	0	0.35	5
C-NGAS-DEV/C-IDEN	C-NGASDIM-	Identifier tags, symbol modifier, and text	0	0.35	6
C-NGAS-FLOW	C-NGASFLM-	Flow direction arrows	0	0.35	6
C-NGAS-FITC	C-NGASFITM-	Caps, crosses, and tees	0	0.35	6
C-NGAS-IDEN	C-NGASIDM-	Identifier tags, symbol modifier, and text	0	0.35	2
C-NGAS-MAIN-PIPE	C-NGASMPM-	Main natural gas piping	0	0.35	6
C-NGAS-METR	C-NGASMEM-	Meiers	0	0.35	3
C-NGAS-PITS-IDEN	C-NGASPIM-	Identifier tags, symbol modifier, and text	0	0.35	1
C-NGAS-PITS-VENT	C-NGASPVN-	Vent pits	0	0.35	3
C-NGAS-PITS-VLVE	C-NGASPVN-	Valve pits/boxes	0	0.35	3
C-NGAS-SERV-PIPE	C-NGASSPM-	Service piping	0	0.35	1
C-NGAS-SIGN	C-NGASSIM-	Surface markers/signs	0	0.35	1
C-NGAS-STNS-IDEN	C-NGASSIM-	Identifier tags, symbol modifier, and text	0	0.35	2
C-NGAS-STNS-PUMP	C-NGASSUM-	Compressor stations	0	0.35	6
C-NGAS-STNS-REDIC	C-NGASSRM-	Reducing stations	0	0.35	6
C-NGAS-TANK	C-NGASTAM-	Tanks	0	0.25	3
<b>Obstructions</b>					
C-OBSTAIRS	C-OBSTM-	Airspace obstructions	0	0.35	3
C-OBST-AIRS-IDEN	C-OBSTDAM-	Obstruction annotation	0	0.35	2
<b>Overrun Areas</b>					
C-OVRN-CNTR	C-OVRNCIM-	Centerlines	7	0.25	1
C-OVRN-CNTR-IDEN	C-OVRNCIM-	Centerline annotation	0	0.35	2
C-OVRN-IDEN	C-OVRNDIM-	Airfield overrun area - annotation	0	0.35	2
C-OVRN-OTLN	C-OVRNOTM-	Airfield overrun area - outlines	0	0.35	4
C-OVRN-SHLD-MRKG	C-OVRNSHM-	Shoulder markings	0	0.35	4
<b>Pads (Aim/Disarm/Calibration, etc.)</b>					
C-PADS-CNTR	C-PADSCIM-	Centerlines	7	0.25	1
C-PADS-CNTR-IDEN	C-PADSCIM-	Centerline annotation	0	0.35	2
C-PADS-IDEN	C-PADSDIM-	Pads - annotation	0	0.35	2
C-PADS-OTLN	C-PADSOIM-	Pad - outlines	0	0.35	4
C-PADS-SHLD	C-PADSSHIM-	Shoulders with annotation	0	0.25	2
<b>Parking Lots</b>					
C-PRKG-CARS	C-PRKGCAM-	Graphic illustration of cars	0	0.35	2
C-PRKG-CNTR	C-PRKGCTM-	Parking lot centerlines	7	0.25	1
C-PRKG-CNTR-IDEN	C-PRKGCTM-	Parking lot centerline annotation	0	0.35	3
C-PRKG-CURB	C-PRKGCM-	Curb and gutters	0	0.35	3
C-PRKG-DRAN	C-PRKGDRM-	Drainage slope indications	0	0.35	1
C-PRKG-FIXT	C-PRKGFIM-	Parking lot fixtures (e.g., wheel stops, parking meters)	0	0.35	91
C-PRKG-FLINE	C-PRKGFLM-	Fire lanes	0	0.25	1
C-PRKG-IDEN	C-PRKGIDM-	Parking lot annotation	0	0.35	6
C-PRKG-MRKG	C-PRKGMRM-	Pavement markings	0	0.35	2
C-PRKG-OTLN	C-PRKGOTLN-	Parking lot outlines	0	0.35	4
C-PRKG-SIGN	C-PRKGSM-	Signs	0	0.35	2
<b>Property</b>					
C-PROP-CONS	C-PROPCOM-	Construction limits/controls, staging area	CONLMT	0.70	7
C-PROP-ESMT	C-PROPESM-	Easements	CONEMT	0.70	0
C-PROP-IDEN	C-PROFIIM-	Property annotation	0	0.35	6

**Discipline: Civil**  
Model File Layers/Levels

Level/Layer Naming		Model File Types			
		Graphic Defaults			
		Line Style	MicroStation Color #	AutoCAD Color #	Line Width (mm)
<b>AIA Format</b>	<b>ISO Format</b>	<b>Level/Layer Description</b>			
C-PROP-RWAY	C-PROPRWYM	Right of ways	6	0.70	7
C-PROP-RWAY-ACOL	C-PROPRWYAM	Right of way to be acquired in perpetuity	0	0.70	7
C-PROP-SECT	C-PROPSMEN	Section lines	7	0.50	6
C-PROP-SECT-IDEN	C-PROPSMIDEN	Section lines annotation	0	0.35	6
C-PROP-TSHIP	C-PROPTSHIP	Township/range lines	4	0.50	6
C-PROP-TSHIP-IDEN	C-PROPTSHIPIDEN	Township/range lines annotation	0	0.35	6
<b>Pavements</b>					
C-PVMT-ASPH	C-PVMTASPH	Pavement pattern - asphalt	0	0.18	8
C-PVMT-CONC	C-PVMTCONC	Pavement pattern - concrete	0	0.18	8
C-PVMT-GRVL	C-PVMTGRVL	Pavement pattern - gravel	0	0.18	8
C-PVMT-IDEN	C-PVMTIDEN	Road, parking lot, railroad, airfield pavement annotation	0	0.25	2
C-PVMT-MRKG	C-PVMTMRKG	Pavement markings	0	0.35	2
C-PVMT-PATT	C-PVMPATT	Joint patterns, text and dimensions	0	0.35	2
<b>Railroads</b>					
C-RAIL-CNTR	C-RAILCMT	Railroad track centerlines	7	0.25	1
C-RAIL-CNTR-IDEN	C-RAILCNTRIDEN	Railroad track centerline annotation	0	0.35	1
C-RAIL-EQPM	C-RAILEQPM	Railroad equipment (e.g., gates, signals)	0	0.35	91
C-RAIL-IDEN	C-RAILIDEN	Railroad - annotation	0	0.35	6
C-RAIL-TRAK	C-RAILTRAK	Railroad tracks	RAILRD	0.35	2
<b>Rivers</b>					
C-RIV-BANK-TOP-	C-RIVRBANKTOP	Top of river bank	0	0.35	5
C-RIVR-BOTM	C-RIVRBOTM	River bottom	0	0.35	5
C-RIVR-CNTR	C-RIVRCNTR	Centerline of river	7	0.25	1
C-RIVR-EDGE	C-RIVREDE	River edge	0	0.50	5
C-RIVR-IDEN	C-RIVRIDEN	Identifier tags, symbol modifiers, and text	0	0.35	2
<b>Roads, Streets, and Highways</b>					
C-ROAD-ASPH	C-ROADASPH	Road outlines - asphalt surface	0	0.25	8
C-ROAD-CNTR	C-ROADCNTR	Road centerlines	7	0.25	1
C-ROAD-CNTR-IDEN	C-ROADCNTRIDEN	Road centerline annotation	0	0.25	1
C-ROAD-CONC	C-ROADCOM	Road outlines - concrete surface	0	0.25	7
C-ROAD-CURB	C-ROADCUM	Curb and gutters	0	0.35	6
C-ROAD-GRAL	C-ROADGRML	Guard rails	GUARD	0.35	6
C-ROAD-GRVL	C-ROADGVM	Road outlines - gravel surface	0	0.25	20
C-ROAD-IDEN	C-ROADIDEN	Road, street, highway annotation	0	0.35	6
C-ROAD-MRKG	C-ROADMRKG	Pavement markings	0	0.35	2
C-ROAD-PATT	C-ROADPATT	Joint patterns, text and dimensions	0	0.35	2
C-ROAD-SHLD	C-ROADSHLD	Roadway shoulder	0	0.35	2
C-ROAD-SIGN	C-ROADSIM	Signs	0	0.25	1
C-ROAD-UPVD	C-ROADUPVD	Road outlines - unpaved surface	0	0.25	3
<b>Riprap and Other Permanent Erosion Control Items</b>					
C-RRAP-GASH	C-RRPGASH	Gabions	V	0.25	1
C-RRAP-MATS	C-RRPAMM	Articulated concrete mats	V	0.25	3
C-RRAP-RVMT	C-RRPRVNM	Revetments	V	0.25	1
C-RRAP-WER	C-RRPWNEM	Wers	V	0.25	3
<b>Runways</b>					
C-RUNW-BLST	C-RUNWBBLST	Blast pad and stopway markings	0	0.35	1
C-RUNW-CNTR	C-RUNWCNTR	Centerlines	7	0.25	1
C-RUNW-CNTR-MRKG	C-RUNWCNTRMRKG	Centerline markings	0	0.35	1
C-RUNW-DISP	C-RUNWDISM	Displaced threshold markings	0	0.35	1
C-RUNW-DIST	C-RUNWDIM	Fixed distance markings	0	0.35	1
C-RUNW-EDGE	C-RUNWRUM	Airfield runway edges	0	0.35	6
C-RUNW-IDEN	C-RUNWIDEN	Airfield runway annotation	0	0.35	2
C-RUNW-SHLD	C-RUNWSHLD	Shoulder markings	0	0.35	6

**Discipline: Civil**  
Model File Layers/Levels

Level/Layer Naming		Graphic Defaults		Model File Types	
<b>AIA Format</b>	ISO Format	Level/Layer Description			
C-RUNW-SIDE	C-RUNWSIM-	Side stripes	0	0.35	4
C-RUNW-TDZM	C-RUNWTDIM-	Touchdown zone markers	0	0.35	6
C-RUNW-THRS	C-RUNWTHRM-	Threshold markers	0	0.35	5
<b>Site Features</b>					
C-SITE-BLN	C-SITEBLIN-	Site breakline	2	0.35	3
C-SITE-FENC-IDEN	C-SITEFEM-	Fences and handrails	0	0.35	6
C-SITE-IDEN	C-SITEIDM-	Fence, handrail, ramp, and trail annotation	0	0.35	6
C-SITE-STRC	C-SITESRM-	Site feature annotation	0	0.35	6
C-SITE-WALK	C-SITEVANM-	Structures (bridges, sheds, foundations, footings, etc.)	0	0.35	22
		Stairs and ramps	0	0.35	6
		Walks, trails and bicycle paths	0	0.35	5
<b>Sanitary Sewer</b>					
C-SSWR-ABND-PIPE	C-SSWRAPIM-	Abandoned piping	2	0.35	2
C-SSWR-DEV/C	C-SSWRDEM-	Grease traps, grill chambers, flumes, neutralizers, oil/water separators, electors, and valves	0	0.35	6
C-SSWR-DEV-CIDEN	C-SSWRDIDM-	Identifier tags, symbol modifier, and text	0	0.25	6
C-SSWR-FILT	C-SSWRFIM-	Filtration beds	0	0.35	3
C-SSWR-FILT-IDEN	C-SSWRFIDM-	Identifier tags, symbol modifier, and text	0	0.35	3
C-SSWR-FLOW	C-SSWRFIM-	Flow direction arrows	0	0.35	6
C-SSWR-FTTG	C-SSWRFITM-	Caps and cleanouts	0	0.35	6
C-SSWR-IDEN	C-SSWRIDM-	Identifier tags, symbol modifier, and text	0	0.35	2
C-SSWR-JBOX	C-SSWRJBM-	Junction boxes and manholes	0	0.35	1
C-SSWR-JBOX-IDEN	C-SSWRJIDM-	Identifier tags, symbol modifier, and text	0	0.35	1
C-SSWR-LAGN	C-SSWRLAM-	Lagoons	0	0.35	3
C-SSWR-LEAC	C-SSWRLEM-	Leach field	0	0.35	3
C-SSWR-MAIN-PIPE	C-SSWRMPM-	Sanitary sewer piping	0	0.35	2
C-SSWR-NITF	C-SSWRNIM-	Nitrification drain fields	0	0.35	3
C-SSWR-PINT	C-SSWRPLM-	Treatment plants	0	0.35	6
C-SSWR-SERV-PIPE	C-SSWRSPPM-	Sanitary sewer service piping	0	0.35	1
C-SSWR-SIGN	C-SSWRSSIM-	Surface markers/signs	0	0.35	1
C-SSWR-STNS-IDEN	C-SSWRSTIM-	Identifier tags, symbol modifier, and text	0	0.35	4
C-SSWR-STNS-PUMP	C-SSWRSPUM-	Booster pump stations	0	0.35	6
C-SSWR-TANK	C-SSWRTAM-	Septic tanks	0	0.35	3
<b>Storm Sewer</b>					
C-STRM-ABND-PIPE	C-STRMAPIM-	Abandoned piping	2	0.35	6
C-STRM-AFFF	C-STRMAFFM-	AF/F lagoon/detention pond	0	0.35	3
C-STRM-CHUT	C-STRMCHIM-	Chutes and concrete erosion control structures	0	0.35	1
C-STRM-CULV	C-STRMCIM-	Culverts	0	0.35	3
C-STRM-DEV/C	C-STRMDEM-	Downspouts, flumes, oil/water separators, and flap gates	0	0.35	6
C-STRM-FLOW	C-STRMFLIM-	Flow direction arrows	0	0.35	6
C-STRM-FMON	C-STRMFIM-	Flow monitoring station	0	0.35	6
C-STRM-FTTG	C-STRMFTM-	Caps and cleanouts	0	0.35	6
C-STRM-HDWL	C-STRMHDM-	Headwalls and endwalls	0	0.50	7
C-STRM-IDEN	C-STRMIDM-	Identifier tags, symbol modifier, and text	0	0.35	4
C-STRM-INLT	C-STRMINIM-	Inlets (curb, surface, and catch basins)	0	0.35	3
C-STRM-LAGN	C-STRMLAM-	Lagoons, ponds, watersheds, and basins	0	0.35	3
C-STRM-MAIN-PIPE	C-STRMMPPM-	Storm sewer piping	0	0.35	6
C-STRM-MHOL	C-STRMMHM-	Manholes	0	0.35	1
C-STRM-ROOF	C-STRMROM-	Roof drain line	0	0.35	3
C-STRM-SPV-PIPE	C-STRMSPIM-	Storm sewer service piping	0	0.35	1
C-STRM-SIGN	C-STRMSIM-	Surface markers/signs	0	0.35	1
C-STRM-STNS-IDEN	C-STRMSTIM-	Identifier tags, symbol modifier, and text	0	0.35	4
C-STRM-STNS-PUMP	C-STRMSPUM-	Pump stations	0	0.35	6

**Discipline: Civil**  
Model File Layers/Levels

Level/Layer Naming				Model File Types	
		Graphic Defaults			
AIA Format	ISO Format	Level/Layer Description	Line Style	MicroStation Color #	AutoCAD Color #
C-STRM-SUBS-PIPE	C-STRMSUM-	Subsurface drain piping	0	0.35	3
<b>Survey</b>					
C-SURV-DATA	C-SURVDAM-	Survey data (benchmarks and horizontal control points or monuments)	0	0.35	6
C-SURV-IDEN	C-SURVIDM-	Survey, baseline, and control line annotation	0	0.35	6
C-SURV-LINE	C-SURVLIM-	Survey, baseline, and control lines	2	0.35	4
<b>Taxways</b>					
C-TAXI-CNTR	C-TAXICNM-	Centerlines	7	0.25	1
C-TAXI-CNTR-IDEN	C-TAXICNM-	Centerline annotation	0	0.35	2
C-TAXI-MRKG	C-TAXCNM-	Centerline markings	0	0.25	1
C-TAXI-EDGE	C-TAXIEDM-	Edge markings	0	0.35	4
C-TAXI-HOLD	C-TAXIHOM-	Holding lines	0	0.35	2
C-TAXI-IDEN	C-TAXIDM-	Taxiway - annotation	0	0.35	2
C-TAXI-OTLN	C-TAXIOTLN-	Taxiway - outlines	0	0.35	4
C-TAXI-SHLD	C-TAXISHM-	Shoulders with annotation	0	0.35	2
<b>Topography</b>					
C-TOPO-BDRY-EXTIR	C-TOPOBEM-	Surface exterior boundary	0	0.18	3
C-TOPO-BDRY-INTF	C-TOPOBM-	Surface interior boundary	2	0.18	1
C-TOPO-BKLN	C-TOPOBKMN-	Breaklines	4	0.50	7
C-TOPO-BKLN-COMM	C-TOPOBKMN-	Subsurface utilities communications breakline	COMMN	0.50	0
C-TOPO-BKLN-DOMW	C-TOPOBKDN-	Subsurface utilities water breakline	WATERL	0.50	0
C-TOPO-BKLN-ELEC	C-TOPOBKEL-	Subsurface utilities electric breakline	ELEGN	0.50	0
C-TOPO-BKLN-FUEL	C-TOPOBKFL-	Subsurface utilities liquid fuel breakline	FUELPT	0.50	0
C-TOPO-BKLN-NGAS	C-TOPOBKGN-	Subsurface utilities natural gas breakline	NGASN	0.50	0
C-TOPO-BKLN-SSWR	C-TOPOBKSWR-	Subsurface utilities sanitary sewer breakline	SSWAF	0.50	0
C-TOPO-BKLN-STRM	C-TOPOBKTN-	Subsurface utilities storm sewer breakline	STRAF	0.50	0
C-TOPO-BORE	C-TOPOBOM-	Boring locations and text	0	0.35	6
C-TOPO-COOR	C-TOPOCOM-	Coordinate grid ticks and text	0	0.35	122
C-TOPO-COOR-LAIC	C-TOPOCLM-	Latitude and longitude grid ticks	0	0.25	3
C-TOPO-COOR-STAT	C-TOPOCSM-	State plane coordinate ticks	0	0.25	3
C-TOPO-DTM0	C-TOPODOM-	DTM obscure area boundary	0	0.35	6
C-TOPO-DPDM	C-TOPODPM-	DTM points	0	0.35	6
C-TOPO-DTMI	C-TOPODTM-	DTM triangles	0	0.35	22
C-TOPO-MAJR	C-TOPOJM-	Major contours	0	0.35	2
C-TOPO-MAJR-IDEN	C-TOPOJDM-	Major contours - annotation	0	0.25	4
C-TOPO-MINR	C-TOPOJNM-	Minor contours	0	0.25	3
C-TOPO-MINR-IDEN	C-TOPOJNIM-	Minor contours - annotation	0	0.25	3
C-TOPO-SHAP	C-TOPOSAM-	Inroads generated shapes/lines	0	0.25	1
C-TOPO-SHOR	C-TOPOSIM-	Shorelines, land features, and references	0	0.35	4
C-TOPO-SLOP-FILL	C-TOPOSIM-	Cuff/fill slopes	0	0.35	2
C-TOPO-SLOP-IDEN	C-TOPOSIM-	Cuff/fill slope, top/foe slope annotation	0	0.35	2
C-TOPO-SLOP-TOPI	C-TOPOSIM-	Top/foe slopes	0	0.35	6
C-TOPO-SOUN	C-TOPOSIM-	Soundings and overbanks	0	0.18	V
C-TOPO-SPOT	C-TOPOSIM-	Spot elevations	0	0.35	2
C-TOPO-SURF-PERM	C-TOPOSIM-	Surface delineator	0	0.18	3
C-TOPO-SURF-PONT	C-TOPOSIM-	Surface feature points	0	0.25	7
C-TOPO-SURF-VOID	C-TOPOSIM-	Surface void region	0	0.18	1
C-TOPO-WATR	C-TOPOWAM-	Water level reference (LWRF, after grading LWRF, SWL etc)	3	0.50	V
<b>Airfield Traffic Areas</b>					
C-TRAF-IDEN	C-TRAFIDM-	Airfield traffic area annotation	0	0.35	2
C-TRAF-TYPE	C-TRAFATM-	Type A traffic area	6	0.50	4
C-TRAF-TYPB	C-TRAFBTM-	Type B traffic area	10	0.50	7
C-TRAF-TYPC	C-TRACTM-	Type C traffic area			
<b>Wetlands</b>					

**Discipline: Civil**  
Model File Layers/Levels

Level/Layer Naming		Model File Types	
		Graphic Defaults	
AIA Format	ISO Format	Level/Layer Description	
C-WETL-BOGS	C-WETLBOM-	Bogs	MicroStation Color # 0
C-WETL-FENS	C-WETLFEM-	Fens	AutoCAD Color # 0
C-WETL-DEN	C-WETLDEN-	Wetland annotation	Line Width (mm) 0.35
C-WETL-MRSH	C-WETLMRM-	Fresh water marshes	Line Width (mm) 0.35
C-WETL-MRSH-SALT	C-WETLMSM-	Tidal saltwater marshes	Line Width (mm) 0.35
C-WETL-MRSH-IDL	C-WETLIDM-	Tidal freshwater marsh	Line Width (mm) 0.35
C-WETL-PCSN	C-WETLPCM-	Pocosins	Line Width (mm) 0.35
C-WETL-PHOL	C-WETLPHM-	Vernal pools, prairies, potholes, wet meadows, and wet prairies	Line Width (mm) 0.35
C-WETL-RPRN	C-WETLRPM-	Riparian forested wetlands	Line Width (mm) 0.35
C-WETL-SLGH	C-WETLSIM-	Sloughs	Line Width (mm) 0.35
C-WETL-SWMP	C-WETLSWM-	Swarms	Line Width (mm) 0.35
<b>Elevations</b>			
C-ELEV-FIXT	C-ELEVFM-	Miscellaneous fixtures	MicroStation Color # 0
C-ELEVIDEN	C-ELEVIDM-	Component identification numbers	AutoCAD Color # 0
C-ELEV-OTLN	C-ELEVOTM-	Building outlines	Line Width (mm) 0.35
C-ELEV-PATT	C-ELEVPM-	Textures and hatch patterns	Line Width (mm) 0.18
C-ELEV-SIGN	C-ELEVSM-	Signage	Line Width (mm) 0.35
<b>Sections</b>			
C-SECT-IDEN	C-SECTIDM-	Component identification numbers	MicroStation Color # 0
C-SECT-MBND	C-SECTMBM-	Material beyond section cut	AutoCAD Color # 0
C-SECT-MCUT	C-SECTMCM-	Cuts through road surfaces, buildings, structures, fence lines, etc.	Line Width (mm) 0.18
C-SECT-PATT	C-SECTPAM-	Textures and hatch patterns	Line Width (mm) 0.18
<b>Details</b>			
C-DETL-GRPH	C-DETLGRM-	Graphics, gridlines, non-text items	MicroStation Color # 0
C-DETL-NPDL	C-DETLNPDM-	Inch-pound-specific dimensions and notes	AutoCAD Color # 0
C-DETL-METR	C-DETLTMM-	Metric-specific dimensions and notes	Line Width (mm) 0.35

Note: V = Varies, NA = Not Applicable

**Discipline: Landscape**  
Model File Layers/Levels

Level/Layer Naming		ISO Format	Level/Layer Description	Graphic Details			Model File Types
Level	Layer			Line Style	Line Width (mm)	AutoCAD Color #	
<b>General Information</b>							
L-ANNO-DIMS	L-----DIP-	L-----DIP-	Witness/extension lines, dimension terminators, dimension text	0	V	V	X
L-ANNO-KEYN	L-----KEP-	L-----KEP-	Reference keynotes with associated leader(s)	0	V	V	X
L-ANNO-NOTE	L-----NOP-	L-----NOP-	General notes and general remarks	0	0.35	2	X
L-ANNO-NPLT	L-----NPP-	L-----NPP-	Non-printing graphic information	0	0.18	5	X
L-ANNO-PATT	L-----PAP-	L-----PAP-	Patternning, poche, shading, and hatching	V	0.18	8	X
L-ANNO-RDME	L-----RDP-	L-----RDP-	Read-me information	0	0.18	5	X
L-ANNO-REFR	L-----RFP-	L-----RFP-	Reference files (AutoCAD users only)	N/A	N/A	N/A	X
L-ANNO-SYMB	L-----SYV-	L-----SYV-	Miscellaneous symbols	V	V	6	X
L-ANNO-TEXT	L-----TEP-	L-----TEP-	Miscellaneous text and callouts with associated leader(s)	0	V	V	X
<b>Irrigation System</b>							
L-IRRG-COVR	L-IRRG-COM-	L-IRRG-COM-	Irrigation coverage, spray distribution patterns	0	0.18	5	X
L-IRRG-EQPM	L-IRRG-EQM-	L-IRRG-EQM-	Equipment (e.g., controllers, valves, RPBs, etc.)	0	0.35	6	X
L-IRRG-HEAD	L-IRRG-HEM-	L-IRRG-HEM-	Irrigation heads, bubblers, and drip irrigation emitters	0	0.25	1	X
L-IRRG-IDEN	L-IRRGIDM-	L-IRRGIDM-	Annotation	0	0.35	2	X
L-IRRG-PIPE	L-IRRGPIP-	L-IRRGPIP-	Piping	LAWNSP	0.35	6	X
L-IRRG-SPKL	L-IRGSPKL-	L-IRGSPKL-	Sprinklers	0	0.35	6	X
<b>Plant and Landscape Material</b>							
L-PLNT-BEDS	L-PLNTBEDM-	L-PLNTBEDM-	Planting beds (perennial and annual beds)	0	0.35	6	X
L-PLNT-BUSH	L-PLNTBUSH-	L-PLNTBUSH-	Bushes and shrubs (e.g., evergreen, deciduous, etc.)	0	0.50	83	X
L-PLNT-BUSH-LINE	L-PLNTBUSHL-	L-PLNTBUSHL-	Bush and shrub line	0	0.50	83	X
L-PLNT-CTNR	L-PLNTCTNM-	L-PLNTCTNM-	Containers or planters	0	0.25	1	X
L-PLNT-GRND	L-PLNTGRDM-	L-PLNTGRDM-	Groundcover and vines	0	0.35	82	X
L-PLNT-IDEN	L-PLNTIDM-	L-PLNTIDM-	Annotation	0	0.35	6	X
L-PLNT-MLCH	L-PLNTMLM-	L-PLNTMLM-	Mulches - organic and inorganic	0	0.25	3	X
L-PLNT-PLTS	L-PLNTPLM-	L-PLNTPLM-	Planting plants (e.g., ornamental annuals and perennials)	0	0.50	83	X
L-PLNT-SHAD	L-PLNTSHM-	L-PLNTSHM-	Shadow areas	0	0.18	5	X
L-PLNT-SPRG	L-PLNTSPM-	L-PLNTSPM-	Sprigs	0	0.25	3	X
L-PLNT-TREE	L-PLNTTRM-	L-PLNTTRM-	Trees (e.g., evergreen, deciduous, etc.)	0	0.50	83	X
L-PLNT-TREE-LINE	L-PLNTTLM-	L-PLNTTLM-	Tree line	TREEL	0.50	83	X
L-PLNT-TURF	L-PLNTTUM-	L-PLNTTUM-	Lawn areas (turfing limits)	0	0.50	23	X
<b>Site Improvements</b>							
L-SITE-BRDG	L-SITEBRDM-	L-SITEBRDM-	Bridges (pedestrian)	0	0.35	22	X
L-SITE-DECK	L-SITEDEM-	L-SITEDEM-	Decks	0	0.35	232	X
L-SITE-FENC	L-SITEFEM-	L-SITEFEM-	Fencing	FENCE	0.35	2	X
L-SITE-FURN	L-SITEFUM-	L-SITEFUM-	Furnishings	0	0.50	4	X
L-SITE-IDEN	L-SITEIDM-	L-SITEIDM-	Annotation	0	0.35	6	X
L-SITE-PLAY	L-SITEPIM-	L-SITEPIM-	Play structures	0	0.35	4	X
L-SITE-POOL	L-SITEPOWM-	L-SITEPOWM-	Pools and spas	0	0.35	162	X
L-SITE-ROCK	L-SITEROM-	L-SITEROM-	Boulders and cobble	0	0.25	1	X
L-SITE-RTWL	L-SITERTM-	L-SITERTM-	Retaining walls	0	0.50	4	X
L-SITE-SPRT	L-SITESPM-	L-SITESPM-	Sports fields	0	0.35	2	X
L-SITE-WALK	L-SITEWAM-	L-SITEWAM-	Walks and steps	0	V	V	X
<b>Detail Information</b>							
L-DETL-GRPH	L-DETLGRM-	L-DETLGRM-	Graphics, gridlines, non-text items	V	V	V	X
L-DETL-INPD	L-DETINNM-	L-DETINNM-	Inch-pound specific dimensions and notes	V	V	V	X
L-DETL-METR	L-DETMEM-	L-DETMEM-	Metric specific dimensions and notes	V	V	V	X

Note: V = Varies, NA = Not Applicable  
Appendix A Model File Level/Layer Assignment Table

**Discipline: Structural**  
**Model File Layers/Levels**

Level/layer Naming		ISO Format		Level/Layer Description		Graphic Defaults		Model File Types					
								Vertical Const		Bridges		Hydraulic Structures	
General Information													
S-ANNO-DIMS	S----DIP-			Witness/extension lines, dimension terminators, dimension text		0	V	V	V	V	V	V	X
S-ANNO-KEYN	S----KEP-			Reference keynotes with associated leader		0	V	V	V	V	V	V	X
S-ANNO-NOTE	S----NOP-			General notes and general remarks		0	0.35	2	4	X	X	X	X
S-ANNO-NPLT	S----NPP-			Non-plotting graphic information		0	0.18	5	1	X	X	X	X
S-ANNO-PATT	S----PAF-			Patternning, poche, shading, and hatching		0	0.18	8	9	X	X	X	X
S-ANNO-RDME	S----RDP-			Read-me information		0	0.18	5	1	X	X	X	X
S-ANNO-REFR	S----REFP-			Reference files (AutoCAD users only)		NA	NA	NA	NA	X	X	X	X
S-ANNO-SYMB	S----SYF-			Miscellaneous symbols		V	V	6	5	X	X	X	X
S-ANNO-TEXT	S----TEP-			Miscellaneous text and callouts with associated leader		0	V	V	V	X	X	X	X
Access	s												
S-ACCSD-ADET	S-ACCSADM-			Adits in galleries and passages		0	0.35	21	30	X	X	X	X
S-ACCSD-CHAM	S-ACCSCHM-			Chambers		0	0.35	22	22	X	X	X	X
S-ACCSD-EVTR	S-ACCSEVM-			Elevators		0	0.35	132	103	X	X	X	X
S-ACCSD-GRLY	S-ACCSSGM-			Galleries, cross overs, trenches, etc		0	0.35	30	86	X	X	X	X
S-ACCSD-HFTCH	S-ACCSSHFM-			Hatches		0	0.25	32	102	X	X	X	X
S-ACCSD-LADD	S-ACCSSLAD-			Ladders and ladder safety devices		0	0.35	162	33	X	X	X	X
S-ACCSD-MHOL	S-ACCSMHM-			Manholes		0	0.35	83	42	X	X	X	X
S-ACCSD-MISC	S-ACCSMMIC-			Miscellaneous access		0	0.35	83	42	X	X	X	X
S-ACCSD-STRS	S-ACCSSSTM-			Stairs		0	0.35	133	111	X	X	X	X
S-ACCSD-STRS-FRMG	S-ACCSSFM-			Stair framing		0	0.35	135	127	X	X	X	X
S-ACCSD-TUNL	S-ACCSTUM-			Tunnels		0	0.35	42	182	X	X	X	X
Alignment													
S-ALIGN-LINE	S-ALIGNLIM-			Alignments		4	0.25	1	3	X	X	X	X
Armor													
S-ARMR-CENR	S-ARMRCRM-			Corner protection, corner cap casting		0	0.25	143	191	X	X	X	X
S-ARMR-LINR	S-ARMRLIM-			Protective liner (used for walls, culverts, etc.)		0	0.25	122	23	X	X	X	X
S-ARMR-MISC	S-ARMRMM-			Miscellaneous armor		0	0.25	143	191	X	X	X	X
S-ARMR-WALL	S-ARMRWAM-			Wall armor		0	0.25	143	191	X	X	X	X
Beams													
S-BEAM-CNTR	S-BEAMCNM-			Beam centerlines		7	0.18	214	117	X	X	X	X
S-BEAM-PRIM	S-BEAMPBM-			Continuous beam or primary beam of two-way beam system		0	0.50	211	109	X	X	X	X
S-BEAM-RBAR	S-BEAMRBM-			Beam rebar		0	0.70	5	1	X	X	X	X
S-BEAM-SECD	S-BEAMSEM-			Gliders or secondary beams of two-way beam system		0	0.35	212	101	X	X	X	X
Bracing													
S-BRAC-DIA~	S-BRACDIA~			Diagonal bracing		0	0.35	161	25	X	X	X	X
S-BRAC-HORZ	S-BRACHOM-			Horizontal bracing		0	0.35	161	25	X	X	X	X
S-BRAC-VERT	S-BRACVEM-			Vertical bracing		0	0.35	144	199	X	X	X	X
Bridges													
S-BRDG-ABUT	S-BRDGABM-			Abutments		0	0.50	83	42	X	X	X	X
S-BRDG-ABUT-RBAR	S-BRDGARB-			Abutment rebar		0	0.70	5	1	X	X	X	X
S-BRDG-BEAR	S-BRDGBEAM-			Bridge bearing		0	0.35	152	88	X	X	X	X
S-BRDG-BEAR-CNTR	S-BRDGBCM-			Bridge bearing centerlines		7	0.18	214	117	X	X	X	X
S-BRDG-BENT	S-BRDGBNM-			Bent cap		0	0.35	3	2	X	X	X	X
S-BRDG-BENT-CNTR	S-BRDGBCTM-			Centerline of bents		7	0.18	214	117	X	X	X	X
S-BRDG-BENT-RBAR	S-BRDGRBM-			Bent cap rebar		0	0.70	5	1	X	X	X	X

**Discipline: Structural**  
Model File Layers/Levels

Level/layer Naming		Model File Types									
		Vertical Const		Bridges		Hydraulic Structures		Flood Control Structures		Misc Small Civil Works Structures	
AIA Format	Level/layer Description										
S-BRDG-CURB	S-BRDGCRM- Curbs/sidewalks on structure	0	0.35	2	4						
S-BRDG-DIAP	S-BRDGDIM- Diaphragms	0	0.35	5	1						
S-BRDG-DIAP-RBAR	S-BRDGDRM- Diaphragm rebar	0	0.70	5	1						
S-BRDG-DRAIN	S-BRDGDAM- Drains	0	0.25	22	22						
S-BRDG-FENC	S-BRDGFEM- Fencing rails, fabric, supports, and gates	0	0.25	3	2						
S-BRDG-FEND	S-BRDGFNM- Fenders	0	0.35	75	220						
S-BRDG-GIRD	S-BRDGGRM- Girders	0	0.35	70	180						
S-BRDG-GIRD-CNTR	S-BRDGGCNR- Girder centerline	7	0.18	114	117						
S-BRDG-HEAD	S-BRDGHM- Headers	0	0.35	112	247						
S-BRDG-PIER	S-BRDGPIM- Piers	0	0.50	83	42						
S-BRDG-STRG	S-BRDGSTM- Stringers	0	0.35	212	101						
<b>Columns</b>											
S-COLS-CNTR	S-COLSCNM- Column centerlines/working lines	7	0.18	40	166						
S-COLS-POST	S-COLSPOM- Short columns	0	0.35	87	74						
S-COLS-PRIM	S-COLSPRM- Primary columns	0	0.35	3	2						
S-COLS-RBAR	S-COLSRBM- Column rear	0	0.70	5	1						
S-COLS-SECD	S-COLSSBM- Secondary columns	0	0.35	84	34						
<b>Decking</b>											
S-DECK-BRDG	S-DECKBRM- Bridge deck	0	0.35	22	22						
S-DECK-BRDG-RBAR	S-DECKBRM- Bridge deck rebar	0	0.70	5	1						
S-DECK-FLOOR	S-DECKFLM- Floor deck	0	0.25	101	186						
S-DECK-ROOF	S-DECKROM- Roof deck	0	0.25	62	116						
<b>Equipment Pads and Foundations</b>											
S-SPADS-QPMM	S-SPADSEQM- Equipment pads	0	0	35	21	30					
S-EROS-BARR	S-EROSBAM- Vapor/capillary water barriers	0	0.25	233	115						
S-EROS-GABN	S-EROSGAM- Gabions	0	0.25	241	179						
S-EROS-PWMT	S-EROSPVM- Slope paving	0	0.25	241	179						
S-EROS-RRAP	S-EROSRMR- Riprap, stone protection, jetties, breakwaters	0	0.25	232	107						
<b>Fasteners &amp; Connections</b>											
S-FSTN-ABL	S-FSTNABM- Anchor bolts	0	0.25	30	86						
S-FSTN-MISC	S-FSTNMIM- Fasteners and connections (non-specific)	0	0.25	13	35						
<b>Foundation</b>											
S-FNDN-ANCH	S-FNDNANM- Anchor piles, blocks, strands, deadmen, soil/rock anchors	0	0.35	42	182						
S-FNDN-CNTR	S-FNDNCNM- Foundation centerlines	7	0.18	44	198						
S-FNDN-DRAN	S-FNDNDRM- Foundation drainage features and objects	0	0.25	43	206						
S-FNDN-FING	S-FNDNFNTM- Footings	0	0.35	42	182						
S-FNDN-FING-RBAR	S-FNDNFRM- Footing rebar	0	0.70	5	1						
S-FNDN-GRBM	S-FNDNGRM- Grade beams	0	0.50	52	36						
S-FNDN-PCAP	S-FNDNPCM- Pile caps	0	0.35	52	36						
S-FNDN-PEDS	S-FNDNPBM- Foundation pedestals/pads	0	0.35	41	190						
S-FNDN-PIER	S-FNDNPIM- Piers, drilled shafts, caissons	0	0.50	72	196						
S-FNDN-PILE	S-FNDNPLM- Piles	0	0.35	40	166						
S-FNDN-RIBS	S-FNDNRM- Ribbed mat foundation	0	0.35	52	36						
S-FNDN-TRM	S-FNDNTRM- Foundation treatment (grouting)	0	0.35	51	28						
S-FNDN-TUNL	S-FNDNTUM- Service tunnel/duct banks	0	0.35	42	182						
<b>Gates</b>											

**Discipline: Structural**  
**Model File Layers/Levels**

Level/layer Naming		ISO Format		Level/layer Description		Graphic Defaults		Model File Types		Details **	
AlA Format	ISO Format	AlA Format	ISO Format	Level/layer Description	Level/layer Description	Line Style*	Line Width (mm)	MicroStation Color #	AutoCAD Color #	3D Allignment	3D Small Civil Works Structures
S-GATE-ANCH	S-GATEANM-	S-GATE-ANCH	S-GATEANM-	Gate anchorages	Dead man anchorage	0	0.25	30	86		
S-GATE-ANCH-DEAD	S-GATEADM-	S-GATE-ANCH-DEAD	S-GATEADM-	Dead man anchorage	Dead man anchorage	0	0.25	30	86		
S-GATE-ARMS	S-GATEARM-	S-GATE-ARMS	S-GATEARM-	Arm	Arm	0	0.35	161	25		
S-GATE-AXIS	S-GATEAXM-	S-GATE-AXIS	S-GATEAXM-	Gate axis and centerlines	Gate axis and centerlines	7	0.18	214	117	X	X
S-GATE-BLKH	S-GATEBLK-	S-GATE-BLKH	S-GATEBLK-	Bulkhead	Bulkhead	0	0.35	5	1		
S-GATE-BLKH-NDLB	S-GATEBLBM-	S-GATE-BLKH-NDLB	S-GATEBLBM-	Bulkhead needles beam	Bulkhead needles beam	0	0.35	212	101		
S-GATE-BLKHANDLS	S-GATEBNM-	S-GATE-BLKHANDLS	S-GATEBNM-	Bulkhead needles	Bulkhead needles	0	0.35	13	35		
S-GATE-CONN	S-GATECOM-	S-GATE-CONN	S-GATECOM-	Gate connects, links	Diagonals, gussets, sleeve riv	0	0.35	30	86		
S-GATE-DIA-	S-GATEDINM-	S-GATE-DIA-	S-GATEDINM-	Diagonals, gussets, sleeve riv	Diagonal channels	0	0.35	13	35		
S-GATE-DIA--CHAN	S-GATEDCM-	S-GATE-DIA--CHAN	S-GATEDCM-	Diagonal channels	Diagonal gusset plate	0	0.35	13	35		
S-GATE-DIA--GUST	S-GATEDGM-	S-GATE-DIA--GUST	S-GATEDGM-	Diagonal gusset plate	Diagonal gusset plate support	0	0.35	13	35		
S-GATE-DIA--SUPRT	S-GATEDMM-	S-GATE-DIA--SUPRT	S-GATEDMM-	Diaphragms	Diaphragms	0	0.35	5	1		
S-GATE-DIAP	S-GATEDAM-	S-GATE-DIAP	S-GATEDAM-	Gate tenders	Gate tenders	0	0.35	75	220		
S-GATE-FEND	S-GATEFEM-	S-GATE-FEND	S-GATEFEM-	Flange	Downstream flange	0	0.35	5	1		
S-GATE-FLING	S-GATEFLM-	S-GATE-FLING	S-GATEFLM-	Girder flange	Girder flange	0	0.35	5	1		
S-GATE-FLING-DNST	S-GATEFDM-	S-GATE-FLING-DNST	S-GATEFDM-	Upstream flange	Upstream flange	0	0.35	30	86		
S-GATE-FLING-GIRD	S-GATEFGM-	S-GATE-FLING-GIRD	S-GATEFGM-	Girder web plates	Girder web plates	0	0.35	162	33		
S-GATE-FLING-UPST	S-GATEFUM-	S-GATE-FLING-UPST	S-GATEFUM-	Gudgeon	Gudgeon	0	0.35	6	5		
S-GATE-GIRD-WEB-	S-GATEGWM-	S-GATE-GIRD-WEB-	S-GATEGWM-	Gudgeon hood	Gudgeon hood	0	0.35	6	5		
S-GATE-GUDG	S-GATEGOM-	S-GATE-GUDG	S-GATEGOM-	Gudgeon hub	Gudgeon hub	0	0.35	6	5		
S-GATE-GUDG-HOOD	S-GATEGHM-	S-GATE-GUDG-HOOD	S-GATEGHM-	Gudgeon pin	Gudgeon pin	0	0.35	6	5		
S-GATE-GUDG-HUB-	S-GATEGHM-	S-GATE-GUDG-HUB-	S-GATEGHM-	Gudgeon (hood) stiffener	Gudgeon (hood) stiffener	0	0.35	6	5		
S-GATE-GUDG-PIN-	S-GATEGPW-	S-GATE-GUDG-PIN-	S-GATEGPW-	Horizontal roiled shapes	Horizontal roiled shapes	0	0.35	211	109		
S-GATE-GUDG-STIF	S-GATEGTM-	S-GATE-GUDG-STIF	S-GATEGTM-	Intercostals	Intercostals	0	0.35	132	103		
S-GATE-HORZ	S-GATEHOM-	S-GATE-HORZ	S-GATEHOM-	Gate jack	Gate jack	0	0.35	5	1		
S-GATE-JACK	S-GATEJAM-	S-GATE-JACK	S-GATEJAM-	Gate jack - horizontal	Gate jack - horizontal	0	0.35	5	1		
S-GATE-JACK-HORZ	S-GATEJHM-	S-GATE-JACK-HORZ	S-GATEJHM-	Gate jack - vertical	Gate jack - vertical	0	0.35	5	1		
S-GATE-JACK-VERT	S-GATEJVM-	S-GATE-JACK-VERT	S-GATEJVM-	Lifting mechanism	Lifting mechanism	0	0.35	142	183		
S-GATE-LIFT	S-GATELJM-	S-GATE-LIFT	S-GATELJM-	Miter guides assembly	Miter guides assembly	0	0.25	5	1		
S-GATE-LITCH	S-GATELTCH-	S-GATE-LITCH	S-GATELTCH-	Latching device	Latching device	0	0.35	30	86		
S-GATE-LITCH-BOTM	S-GATELTCHM-	S-GATE-LITCH-BOTM	S-GATELTCHM-	Latching device - bottom	Latching device - bottom	0	0.35	30	86		
S-GATE-LITCH-TOP~	S-GATELTCHM~	S-GATE-LITCH-TOP~	S-GATELTCHM~	Latching device - top	Latching device - top	0	0.35	5	1		
S-GATE-LUBE	S-GATELUM-	S-GATE-LUBE	S-GATELUM-	Lubrication system	Lubrication system	0	0.25	5	1		
S-GATE-MISC	S-GATEMM-	S-GATE-MISC	S-GATEMM-	Gates incidental to structure	Gates incidental to structure	0	0.25	5	1		
S-GATE-MITR-ASSY	S-GATEQNM-	S-GATE-MITR-ASSY	S-GATEQNM-	Miter guide assembly	Miter guide assembly	0	0.35	152	88		
S-GATE-PIN~	S-GATEPINM-	S-GATE-PIN~	S-GATEPINM-	Pin pins	Pin pins	0	0.25	30	86		
S-GATE-PNTL~	S-GATEPNTL-	S-GATE-PNTL~	S-GATEPNTL-	Pinle ball, bushing & base	Pinle ball, bushing & base	0	0.35	30	86		
S-GATE-PNTL-CAST	S-GATEPCM-	S-GATE-PNTL-CAST	S-GATEPCM-	Pinle casting	Pinle casting	0	0.35	62	116		
S-GATE-QIN	S-GATEQNM-	S-GATE-QIN	S-GATEQNM-	Quoin	Quoin	0	0.35	152	88		
S-GATE-QIN-FLNG	S-GATEQNM-	S-GATE-QIN-FLNG	S-GATEQNM-	Quoin flange	Quoin flange	0	0.35	152	88		
S-GATE-QIN-MITTER	S-GATEQNM-	S-GATE-QIN-MITTER	S-GATEQNM-	Quoin, mitter	Quoin, mitter	0	0.35	152	88		
S-GATE-QIN-STIF	S-GATEQNM-	S-GATE-QIN-STIF	S-GATEQNM-	Quoin stiffener	Quoin stiffener	0	0.35	152	88		
S-GATE-QIN-TRST	S-GATEQNM-	S-GATE-QIN-TRST	S-GATEQNM-	Quoin thrust plate	Quoin, thrust plate	0	0.35	152	88		
S-GATE-QINWALL	S-GATEQNM-	S-GATE-QINWALL	S-GATEQNM-	Quoin wall	Quoin wall	0	0.35	152	88		
S-GATE-QINWEB~	S-GATEQNM~	S-GATE-QINWEB~	S-GATEQNM~	Quoin web	Quoin web	0	0.35	152	88		

**Discipline: Structural**  
Model File Layers/Levels

Level/layer Naming		ISO Format		Level/layer Description		Graphic Defaults		Model File Types	
AIA Format	ISO Format	Line Style#	Line Width (mm)	MicroStation Color #	AutoCAD Color #	Vertical Const	Bridges	Hydraulic Structures	3D Allignment
S-GATE-RAIL	S-GATERAM-	Rails and guides	0	0.35	152	88			
S-GATE-SEAL	S-GATESM-	Gate seal	0	0.35	232	107			
S-GATE-SEAL-HORZ	S-GATESHM-	Gate seal - horizontal	0	0.35	232	107			
S-GATE-SEAL-VERT	S-GATESVM-	Gate seal - vertical	0	0.35	232	107			
S-GATE-SHOE	S-GATESOM-	Gate shoe	0	0.35	142	183			
S-GATE-SKIN	S-GATESRM-	Skin plates	0	0.25	142	183			
S-GATE-STIF	S-GATESTM-	Stiffener	0	0.35	5	1			
S-GATE-STIF-LONG	S-GATESLM-	Stiffener - longitudinal	0	0.35	5	1			
S-GATE-STIF-TRAN	S-GATESTM-	Stiffener - transverse	0	0.35	5	1			
S-GATE-STOP	S-GATESPM-	Stoplogs	0	0.35	42	182			
S-GATE-TBL	S-GATETHM-	Thimble	0	0.25	241	179			
S-GATE-TRST	S-GATETRM-	Thrust plate	0	0.25	122	23			
S-GATE-TRUN	S-GATETRM-	Trunion	0	0.35	6	5			
S-GATE-VALV	S-GATEVAM-	Valves (general shape)	0	0.35	202	21			
S-GATE-VERT	S-GATEVEM-	Rolled vertical shapes	0	0.35	144	199			
S-GATE-WALK	S-GATEWM-	Walkway	0	0.35	132	103			
S-GATE-WALK-FRMG	S-GATEWM-	Walkway - framing	0	0.35	132	103			
S-GATE-WALK-GRTG	S-GATEWM-	Walkway - grating	0	0.35	132	103			
S-GATE-WALK-SUPRT	S-GATEWSM-	Walkway - support	0	0.35	132	103			
S-GATE-WEBS~	S-GATEWEM-	Web	0	0.35	162	33			
<b>Grade Lines</b>									
S-GRLN-SURF-E	S-GRLNSEM-	Existing ground	3	0.25	31	110	X	X	X
S-GRLN-SURF-N	S-GRLNSNM-	Finished grade	0	0.35	32	102	X	X	X
S-WATR-SURF	S-WATRSUM-	Water surface	0	0.25	161	25	X	X	X
<b>Grids</b>									
S-GRID-HORZ	S-GRIDHOM-	Grid lines (horizontal)	7	0.18	6	5	X	X	X
S-GRID-HORZ-IDEN	S-GRIDHIDEN-	Column (1.D. tags (horizontal))	0	0.25	6	5	X	X	X
S-GRID-VERT	S-GRIDVEM-	Grid lines (vertical)	7	0.18	6	5	X	X	X
S-GRID-VERT-IDEN	S-GRIDVIDEN-	Column (1.D. tags (vertical))	0	0.25	6	5	X	X	X
<b>Hydraulic Features</b>									
S-HYDR-AXIS	S-HYDRAXM-	Axis of structure	4	0.18	202	21	X	X	X
S-HYDR-BAFL	S-HYDRBAM-	Baffle blocks, splash pads	0	0.35	122	23	X	X	X
S-HYDR-BASN	S-HYDRBSM-	Stilling and settling basins	0	0.35	122	23	X	X	X
S-HYDR-CHAN	S-HYDRCHM-	Channel (Does not include earthen structures)	0	0.35	122	23	X	X	X
S-HYDR-COFF	S-HYDRCOM-	Cofferdam	0	0.35	42	182	X	X	X
S-HYDR-COND	S-HYDRCONM-	Divisionary/bypass conduits and culverts	0	0.35	122	23	X	X	X
S-HYDR-DAM	S-HYDRDAM-	Dam	0	0.35	122	23	X	X	X
S-HYDR-FISH	S-HYDRFIM-	Fish ladder or passage	0	0.35	122	23	X	X	X
S-HYDR-FLUM	S-HYDRFLUM-	Flume	0	0.35	122	23	X	X	X
S-HYDR-INTK	S-HYDRINTK-	Intake, outlet	0	0.35	122	23	X	X	X
S-HYDR-NOVR	S-HYDRNOVM-	Non-overflow structures	0	0.35	122	23	X	X	X
S-HYDR-PENS	S-HYDRPENM-	Penstock outline and features	0	0.35	122	23	X	X	X
S-HYDR-STRC-POWR	S-HYDRSPM-	Powerhouse	0	0.35	124	39	X	X	X
S-HYDR-SWAY	S-HYDRSM-	Spillway	0	0.35	122	23	X	X	X
S-HYDR-WEIR	S-HYDRWEM-	Weirs and structures	0	0.35	122	23	X	X	X
<b>Joints</b>									
S-JNTS-ONTJ	S-JNTSCNM-	Construction/joint/joints - (Do not use when 3D modeling)	0	0.25	122	23	X	X	X

**Discipline: Structural**  
Model File Layers/Levels

Level/layer Naming		Graphic Details		Model File Types			
AIA Format	ISO Format	Level/layer Description		Vertical Const.	Bridges	Hydraulic Structures	
S-JNTS-CTLU	S-JNTSCTLM-	Control/contraction joints (saw cut) - <i>(Do not use when 3D modelling)</i>	0	0.25	122	23	
S-JNTS-EXPU	S-JNTSEXIM-	Expansion joints, joint materials (e.g. felt) - <i>(Do not use when 3D modelling)</i>	0	0.25	124	39	
S-JNTS-STUC	S-JNTSSTM-	Stucco joints - <i>(Do not use when 3D modelling)</i>	0	0.25	111	246	
S-JNTS-WTRS	S-JNTSWTM-	Watertops	0	0.25	221	189	
<b>Joints</b>		Details **					
S-JOIS-BRDG	S-JOISBRM-	Bridging	0	0	35	82	18
S-JOIS-GIRD	S-JOISGIM-	Joist girders	0	0	50	122	23
S-JOIS-PERI	S-JOISPEM-	Perimeter channel or rim joist	0	0	35	142	183
S-JOIS-PRIM	S-JOISPRM-	Primary joists	0	0	35	132	103
S-JOIS-SECD	S-JOISSEM-	Secondary joists	0	0	35	134	119
S-JOIS-TRIM	S-JOISTRM-	Partial length or trimmer floor joist	0	0	35	134	119
<b>Fabrications (metal or other specialty)</b>		3D Allignment					
S-FABR-EMBD	S-FABREMM-	Embedded metals (framing around openings)	0	0	35	183	201
S-FABR-HOIS	S-FABRHOM-	Hoist structures	0	0	25	142	183
S-FABR-HOOK	S-FABRKIM-	Line hooks, lifting hooks, check posts etc	0	0	25	142	183
S-FABR-MOOR	S-FABRMOM-	Mooring bitts, chocks, rings	0	0	35	142	183
S-FABR-PL--	S-FABRPLM-	Plates	0	0	35	142	183
S-FABR-TRSH	S-FABRTRM-	Trash racks, intake screens	0	0	35	142	183
<b>Pipes and Culverts</b>		Misc Small Civil Works Structures					
S-PIPE-CULV	S-PIPECLM-	Precast/manufactured culverts	0	0	35	200	13
<b>Platforms</b>		Hydraulic Steel Structures					
S-PLAT-FRMG	S-PLATFRM-	Platform frame/stringers	0	0	35	212	101
S-PLAT-GRTG	S-PLATGRM-	Platform grating (add a second minor group to indicate platform # or elev)	0	0	25	121	15
S-PLAT-WALK	S-PLATWAM-	Platform walkway	0	0	35	33	126
<b>Reinforcement</b>		Vertical Tendons					
S-REIN-RBAR	S-REINRBM-	Steel reinforcement, welded wire fabric	0	0	70	5	1
S-REIN-TEND-HORZ	S-REINTTHM-	Horizontal Tendons	0	0	50	181	185
S-REIN-TEND-VERT	S-REINTVM-	Vertical Tendons	0	0	50	181	185
<b>Reference Outlines</b>		Horizontal Tendons					
S-OTLN-BLDG	S-OTLNBLM-	Building outline	6	0.25	5	1	
S-OTLN-FLOR	S-OTLNFLM-	Floor outline	6	0.25	5	1	
S-OTLN-OPNG	S-OTLNOPM-	Openings	6	0.25	5	1	
S-OTLN-ROOF	S-OTLNROM-	Roof	6	0.25	5	1	
S-OTLN-STRC	S-OTLNSTM-	Misc. structures	6	0.25	5	1	
<b>Safety Features</b>		Waterway safety barriers					
S-SAFE-FENC	S-SAFEFM-	Fencing rails, fabric, supports, and gates	0	0	25	3	2
S-SAFE-GRAL	S-SAFEGRM-	Guardrails	0	0	35	62	116
S-SAFE-HRAL	S-SAFEHRM-	Handrails, railings	0	0	25	3	2
S-SAFE-PARA	S-SAFEPM-	Parapet/Jersey barrier	0	0	50	3	2
S-SAFE-PARA-RBAR	S-SAFEPRM-	Parapet/Jersey barrier rebars	0	0	70	5	1
S-SAFE-WTR	S-SAFEWAM-	Waterway safety barriers	0	0	35	3	2
<b>Signs</b>		Sign buoys					
S-SIGN-BUOY	S-SIGNBUM-	Sign buoys	0	0	35	242	187
S-SIGN-EXTN	S-SIGNEXM-	Extrusions	0	0	35	212	101
S-SIGN-FRMG	S-SIGNFRM-	Framing & connections	0	0	35	3	2
S-SIGN-GAGE	S-SIGNGAM-	Staff gauges	0	0	35	232	107
S-SIGN-PANL	S-SIGNPAM-	Sign panels	0	0	35	232	107

**Discipline: Structural**  
**Model File Layers/Levels**

Level/layer Naming		ISO Format		Level/layer Description		Graphic Defaults		Model File Types	
AIA Format	ISO Format	S-SIGN-SPRT	S-SIGNSUM-	Supports	Signage text	Line Style*	Line Width (mm)	MicroStation Color #	AutoCAD Color #
<b>Slabs</b>	<b>S-SLAB-TEXT</b>	S-SLABAPR-	S-SLABAPR-M-	Approach slab		0	0.35	5	1
		S-SLAB-APPR-RBAR	S-SLABAR-M-	Approach slab rebar		0	0.35	222	181
		S-SLAB-EDGE	S-SLAMEDGE-M-	Edge of slab		0	0.35	41	190
		S-SLAB-RBAR	S-SLABRB-M-	Slab rebar		0	0.35	41	190
		S-SLAB-SECD	S-SLABSEM-M-	Second pour, slab cap		0	0.35	41	190
		S-SLAB-SILL	S-SLABSILL-M-	Sill		0	0.35	41	190
<b>Stiffeners</b>	<b>S-STIF-LONG</b>	S-STIFLON-M-	S-STIFLON-M-	Stiffeners - longitudinal		0	0.35	3	2
	<b>S-STIF-TRAN</b>	S-STIFTTRN-M-	S-STIFTTRN-M-	Stiffeners - transverse		0	0.35	3	2
<b>Trusses</b>	<b>S-TRUS-PRIM</b>	S-TRUSPRIM-M-	S-TRUSPRIM-M-	Primary trusses		0	0.50	4	7
	<b>S-TRUS-SECND</b>	S-TRUSSECM-M-	S-TRUSSECM-M-	Secondary trusses		0	0.35	6	5
<b>Walls</b>	<b>S-WALL-ABUT</b>	S-WALLABM-M-	S-WALLABM-M-	Abutments		0	0.35	83	42
	<b>S-WALL-CELL</b>	S-WALLCEM-M-	S-WALLCEM-M-	Cell		0	0.35	30	86
	<b>S-WALL-COFF</b>	S-WALLCOM-M-	S-WALLCOM-M-	Cutoff wall		0	0.35	72	196
	<b>S-WALL-CURT</b>	S-WALLCRM-M-	S-WALLCRM-M-	Curtain/breast wall		0	0.35	3	2
	<b>S-WALL-FULL</b>	S-WALLFU-M-	S-WALLFU-M-	Wall going to the top of the structure		0	0.35	72	196
	<b>S-WALL-GARD</b>	S-WALLGAM-M-	S-WALLGAM-M-	Guard/guide walls		0	0.35	72	196
	<b>S-WALL-LOAD</b>	S-WALLLOD-M-	S-WALLLOD-M-	Load bearing walls		0	0.35	3	2
	<b>S-WALL-MONO</b>	S-WALLMONO-M-	S-WALLMONO-M-	Wall monoliths		0	0.35	3	2
	<b>S-WALL-MSE-</b>	S-WALLMSM-M-	S-WALLMSM-M-	Mechanically stabilized earth (MSE) wall		0	0.35	72	196
	<b>S-WALL-NONL</b>	S-WALLNOM-M-	S-WALLNOM-M-	Non-load bearing walls		0	0.35	72	196
	<b>S-WALL-PRHT</b>	S-WALLPRM-M-	S-WALLPRM-M-	Wall that does not reach to the top of the structure		0	0.35	72	196
	<b>S-WALL-RBAR</b>	S-WALLRB-M-	S-WALLRB-M-	Wall rebar		0	0.70	5	1
	<b>S-WALL-RTWL</b>	S-WALLRTM-M-	S-WALLRTM-M-	Retaining wall (flood walls, wingwalls, etc.)		0	0.35	72	196
	<b>S-WALL-SHEA</b>	S-WALLSM-M-	S-WALLSM-M-	Shear walls		0	0.35	101	186
	<b>S-WALL-STUD</b>	S-WALLSTM-M-	S-WALLSTM-M-	Stud walls		0	0.35	42	182
<b>Watertight Specialties</b>	<b>S-WWAY-DLPH</b>	S-WWAYDL-M-	S-WWAYDL-M-	Dolphins (associated with but not part of bridges, locks and guidewalls)		0	0.35	122	23
	<b>S-WWAY-FEND</b>	S-WWAYFEM-M-	S-WWAYFEM-M-	Fenders		0	0.35	75	220
	<b>S-WWAY-MOOR</b>	S-WWAYMOM-M-	S-WWAYMOM-M-	Mooring cells		0	0.35	142	183
<b>Details</b>	<b>S-DETL-GRPH</b>	S-DETLGRM-M-	S-DETLGRM-M-	Graphics, gridlines, non-text items		V	V	V	V
	<b>S-DETL-INPD</b>	S-DETLINPM-M-	S-DETLINPM-M-	Inch-pound specific dimensions and notes		0	0.35	1	3
	<b>S-DETL-METR</b>	S-DETMEM-M-	S-DETMEM-M-	Metric-specific dimensions and notes		0	0.35	3	2

NOTES:

\* Hidden lines will be drawn using line style 2, weight 0.2¢

\*\* This model type is for generic details that will be utilized on multiple projects. It is assumed that other details will be referenced from the feature design model.

**Discipline: Architectural**  
Model File Layers/Levels

AIA Format	ISO Format	Level/Layer Naming	Level/Layer Description	Graphic Details				Model File Types				
				Line Style	Line Width (mm)	AutoCAD Color #	MicroStation Color #	Elevations	Sections	Equipment Plan	Area Calculations/Occupancy Plan	Root Plan
<b>General Information</b>												
A-ANNO-DIMS	A-----DIP-		Witness/extension lines, dimension terminators, dimension text	0	0	V	V	X	X	X	X	X
A-ANNO-KEYN	A----KEP-		Reference keynotes with associated leader	0	0	V	V	X	X	X	X	X
A-ANNO-MASK	A----MAP-		Text/shape mask for use with photo backgrounds	0	0.18	113	16	X	X	X	X	X
A-ANNO-NOTE	A----NDF-		General notes and general remarks	0	0.35	2	4	X	X	X	X	X
A-ANNO-NPLT	A----NPP-		Non-printing graphic information	0	0.18	5	1	X	X	X	X	X
A-ANNO-PATT	A----PAP-		Pattern, poche, shading, and hatching	V	0.18	8	9	X	X	X	X	X
A-ANNO-RDMF	A----RDP-		Read-me information	0	0.18	5	1	X	X	X	X	X
A-ANNO-REFR	A----RFP-		Reference files (AutoCAD users only)	NA	NA	NA	NA	X	X	X	X	X
A-ANNO-SYMB	A----SYV-		Miscellaneous symbols	V	V	6	5	X	X	X	X	X
A-ANNO-TEXT	A----TEP-		Miscellaneous text and callouts with associated leader	0	V	V	V	X	X	X	X	X
<b>Area Information</b>												
A-AREA-ADEN	A-AREADIM-		Room numbers, tenant identifications, area calculation	0	0	0.35	2	4	X	X	X	X
A-AREA-LINE	A-AREALIM-		Architectural area calculation boundary line	0	0.50	4	7	X	X	X	X	X
A-AREA-OCCP	A-AREACOM-		Occupant or employee names	0	0.35	2	4	X	X	X	X	X
A-AREA-PATT	A-AREAPAM-		Area cross-hatching	0	0.18	8	9	X	X	X	X	X
<b>Celing Information</b>												
A-CLNG-ACCS	A-CLNGACM-		Access panels	0	0	0.35	6	5	X	X	X	X
A-CLNG-CTLJ	A-CLNGCJM-		Ceiling control joints	0	0	0.35	2	4	X	X	X	X
A-CLNG-GRID	A-CLNGGRM-		Ceiling grid	0	0.25	1	3	X	X	X	X	X
A-CLNG-LITE	A-CLNLIM-		Specially ceiling lights not shown on the Electrical Lighting Plan	0	0.50	4	7	X	X	X	X	X
A-CLNG-OPNG	A-CLNGOPM-		Openings, ceiling/roof penetrations (see also A-FLOOR-OVHD in Floor Plan model file)	0	0.18	8	9	X	X	X	X	X
A-CLNG-PATT	A-CLNGPAM-		Ceiling patterns	0	0.18	8	9	X	X	X	X	X
A-CLNG-SFFT	A-CLNGSFM-		Soffits	0	0.25	2	4	X	X	X	X	X
A-CLNG-SUPP	A-CLNGSUM-		Suspended elements, ceiling mounted specialties (e.g., clocks, fans, etc.	0	0.18	5	1	X	X	X	X	X
A-CLNG-TEES	A-CLNGTEM-		Main tees	0	0.18	5	1	X	X	X	X	X
<b>Columns</b>												
A-COLS-ENCL	A-COLSENN-		Column enclosures/fire protection	0	0	0.50	4	7	X	X	X	X
<b>Doors</b>												
A-DOOR-FULL	A-DOOREU-		Full height (to ceiling) door: swing and leaf	0	0	0.25	3	2	X	X	X	X
A-DOOR-IDEN	A-DOORIDM-		Door number and symbol, hardware group, etc.	0	0	0.25	3	2	X	X	X	X
A-DOOR-PRHT	A-DOORPRM-		Partial height door: swing and leaf	0	0	0.35	6	5	X	X	X	X
A-DOOR-SYMB	A-DOORSYM-		Miscellaneous door symbols (e.g., overhead, bi-fold, pocket, etc.)	0	0.25	1	3	X	X	X	X	X
<b>Equipment</b>												
A-EQPM-ACCS	A-EQPMACM-		Equipment access	0	0	0.35	6	5	X	X	X	X
A-EQPM-FIXD	A-EQPFM-		Fixed equipment	0	0	0.50	4	7	X	X	X	X
A-EQPM-IDEN	A-EQPMIDM-		Equipment identification numbers	0	0	0.35	6	5	X	X	X	X
A-EQPM-MOVE	A-EQPMCM-		Moveable equipment	0	0	0.35	6	5	X	X	X	X
A-EQPM-OVHD	A-EQPMOV-		Overhead, ceiling mounted, or suspended equipment	0	0	0.35	6	5	X	X	X	X
<b>Floor Information</b>												
A-FLOR-CASE	A-FLORCAM-		Casework (manufactured cabinets)	0	0	0.25	3	2	X	X	X	X
A-FLOR-EVTR	A-FLOREVM-		Elevator cars and equipment	0	0	0.35	2	4	X	X	X	X
A-FLOR-FIXT	A-FLORFXM-		Plumbing fixtures	0	0	0.25	201	29	X	X	X	X
A-FLOR-HRAL	A-FLORHRM-		Stair and balcony handrails, guard rails	0	0	0.25	1	3	X	X	X	X
A-FLOR-IDEN	A-FLORIDM-		Room name, space identification text	0	0	0.35	3	2	X	X	X	X
A-FLOR-LEV1	A-FLORLEM-		Level changes, shafts, ramps, pits, breaks in construction, and depression	0	0	0.35	6	5	X	X	X	X
A-FLOR-NUMB	A-FLORNUM-		Room/space identification number and symbol	0	0	0.35	3	2	X	X	X	X

**Discipline: Architectural**  
Model File Layers/Levels

Level/layer Naming		ISO Format	Level/layer Description	Graphic Details		Model File Types	
Level	Layer			Line Style	Line Width (mm)	AutoCAD Color #	MicroStation Color #
A-FLOOR-OTLN	A-FLOOR-OTLN	A-FLOOR-OTLN-	Floor outline/perimeter/building footprint	0	0.50	4	7
A-FLOOR-OTLN-RPRM	A-FLOOR-OTLN-RPRM	A-FLOOR-OTLN-	Room perimeter shape (interior walls)	0	0.35	2	4
A-FLOOR-OVHD	A-FLOOR-OVHD	A-FLOOR-OVHD-	Overhead items (skylights, overhangs, etc.)	2	0.18	8	9
A-FLOOR-PATT	A-FLOOR-PATT	A-FLOOR-PATT-	Paving, tile, carpet patterns	0	0.18	8	9
A-FLOOR-RAIS	A-FLOOR-RAIS	A-FLOOR-RAIS-	Paving, tile, carpet patterns	0	0.25	3	2
A-FLOOR-SIGN	A-FLOOR-SIGN	A-FLOOR-SIGN-	Access (raised) flooring	0	0.25	1	3
A-FLOOR-SFCL	A-FLOOR-SFCL	A-FLOOR-SFCL-	Signage	0	0.25	3	2
A-FLOOR-STRS	A-FLOOR-STRS	A-FLOOR-STRS-	Architectural specialties (e.g., toilet room accessories, display cases)	0	0.25	1	3
A-FLOOR-TPTN	A-FLOOR-TPTN	A-FLOOR-TPTN-	Stair risers/streads, escalators, ladders	0	0.25	1	3
A-FLOOR-WDWK	A-FLOOR-WDWK	A-FLOORWDWK-	Toilet partitions	0	0.25	1	3
<b>Windows</b>		<b>Windows</b>		<b>Windows</b>		<b>Windows</b>	
A-GLAZ-FULL	A-GLAZ-FULL	A-GLAZ-FULL-	Full height glazed walls and partitions (see A-WALL-CWM/G for curtain walls)	0	0.25	1	3
A-GLAZ-IDEN	A-GLAZ-IDEN	A-GLAZIDEN-	Window number and symbol	0	0.35	3	2
A-GLAZ-PRHT	A-GLAZ-PRHT	A-GLAZPRHT-	Windows and partial height glazed partitions	0	0.25	1	3
A-GLAZ-SILL	A-GLAZ-SILL	A-GLAZSILL-	Window sills	0	0.18	5	1
<b>Roof Information</b>		<b>Roof Information</b>		<b>Roof Information</b>		<b>Roof Information</b>	
A-ROOF-CRTS	A-ROOF-CRTS	A-ROOFCRTS-	Crickets flow arrows flow info	0	0.25	1	3
A-ROOF-EXPJ	A-ROOF-EXPJ	A-ROOFEXPJ-	Expansion joints	0	0.18	5	1
A-ROOF-GUTR	A-ROOF-GUTR	A-ROOFGUTR-	Roof internal gutters	0	0.18	8	9
A-ROOF-HRAL	A-ROOF-HRAL	A-ROOFRAL-	Stair handrails, nosings, guard rails	0	0.18	5	1
A-ROOF-LEVEL	A-ROOF-LEVEL	A-ROOFLVL-	Level changes	0	0.18	5	1
A-ROOF-OTLN	A-ROOF-OTLN	A-ROOFOTLN-	Roof perimeter/edge, roof geometry	0	0.35	6	5
A-ROOF-PATT	A-ROOF-PATT	A-ROOFPATT-	Roof surface patterns, hatching	0	0.18	8	9
A-ROOF-RDTR	A-ROOF-RDTR	A-ROOFRDTR-	Roof drains	0	0.25	1	3
A-ROOF-SPCL	A-ROOF-SPCL	A-ROOFSPL-	Roof specialties, accessories, access hatches, dormers	0	0.25	3	2
A-ROOF-STRS	A-ROOF-STRS	A-ROOFSTRS-	Stair risers/streads, ladders	0	0.18	5	1
A-ROOF-WAM	A-ROOFWAM	A-ROOFWAM-	Roof walkways	0	0.25	3	2
A-ROOF-WALL	A-ROOFWALL	A-ROOFWALL-	Parapet walls and wall caps	0	0.35	2	4
<b>Walls</b>		<b>Walls</b>		<b>Walls</b>		<b>Walls</b>	
A-WALL-CAVI	A-WALL-CAVI	A-WALLCAVI-	Cavity wall lines	0	0.18	8	9
A-WALL-CNTR	A-WALL-CNTR	A-WALLCNTR-	Wall centerlines	7	0.18	5	1
A-WALL-OWNG	A-WALL-OWNG	A-WALLCWN-	Curtain wall mullions and glass	0	0.25	1	3
A-WALL-FIRE	A-WALL-FIRE	A-WALLFIR-	Fire wall designators (patterning)	0	0.35	2	4
A-WALL-FULL-EXTR	A-WALL-FULL-EXTR	A-WALLFEM-	Exterior full height walls	0	0.35	2	4
A-WALL-FULL-INTR	A-WALL-FULL-INTR	A-WALLFNM-	Interior full height walls	0	0.25	3	2
A-WALL-HEAD	A-WALL-HEAD	A-WALLHEM-	Door and window headers	0	0.25	1	3
A-WALL-IDEN	A-WALL-IDEN	A-WALLIDM-	Wall identification/type text or tags	0	0.35	3	2
A-WALL-JAMB	A-WALL-JAMB	A-WALLJAM-	Door and window jambs	0	0.25	1	3
A-WALL-MOVE	A-WALL-MOVE	A-WALLMOM-	Moveable walls/partitions	0	0.18	5	1
A-WALL-OPEN-VRS	A-WALL-OPEN-VRS	A-WALLOLM-	Louvres	0	0.25	1	3
A-WALL-PATT	A-WALL-PATT	A-WALLPAM-	Wall insulation, hatching, and fill	INBATT	0.18	8	9
A-WALL-PRHT	A-WALL-PRHT	A-WALLPRM-	Partial height walls (do not appear on Reflected Ceiling Plan)	0	0.25	1	3
A-WALL-SPCL	A-WALL-SPCL	A-WALLSPM-	Wall-hung/attached specialties (e.g., fixtures, grab bars (incl. handicap), telephone booths)	0	0.25	1	3
<b>Elevations</b>		<b>Elevations</b>		<b>Elevations</b>		<b>Elevations</b>	
A-ELEV-CASE	A-ELEV-CASE	A-ELEVCASE-	Wall-mounted casework	0	0.25	3	2
A-ELEV-FIXT	A-ELEV-FIXT	A-ELEVFIXT-	Plumbing fixtures	0	0.35	2	4

**Discipline: Architectural**  
Model File Layers/Levels

Level/layer Naming		ISO Format	Level/layer Description	Graphic Details		Model File Types	
AIA Format	Level/layer Name			Line Style	Line Width (mm)		
A-ELEV-FNSH	A-ELEV/FNIM-	A-ELEV-FNSH	Finishes, woodwork, trim	0	0.25	3	
A-ELEV-IDEN	A-ELEV-IDEN	A-ELEV-IDEN	Component identification numbers	0	0.35	2	
A-ELEV-OTLN	A-ELEV-OTLN	A-ELEV/OTLN	Building outlines	0	0.50	4	
A-ELEV-PATT	A-ELEV-PATT	A-ELEV/PATT	Textures and hatch patterns	0	0.18	7	
A-ELEV-SIGN	A-ELEV/SIGN	A-ELEV/SIGN	Signage	0	0.25	8	
<b>Sections</b>		<b>Sections</b>		<b>Sections</b>		<b>Sections</b>	
A-SECT-IDEN	A-SECT-IDEN	A-SECT-IDEN	Component identification numbers	0	0.35	2	
A-SECT-MBND	A-SECT-MBND	A-SECT-MBND	Material beyond section cut	0	0.18	4	
A-SECT-MCUT	A-SECT-MCUT	A-SECT-MCUT	Material cut by section	V	V	1	
A-SECT-PATT	A-SECT-PATT	A-SECT-PATT	Textures and hatch patterns	V	V	5	
<b>Detail Information</b>		<b>Detail Information</b>		<b>Detail Information</b>		<b>Detail Information</b>	
A-DETL-GRPH	A-DETL-GRPH	A-DETL-GRPH	Graphics, gridlines, non-text items	V	V	V	
A-DETL-INPD	A-DETL-INPD	A-DETL-INPD	Inch-bound specific dimensions and notes	0	V	V	
A-DETL-METR	A-DETL-METR	A-DETL-METR	Metric specific dimensions and notes	0	V	V	

Note: V = Varies, NA = Not Applicable

**Discipline: Interiors**  
Model File Layers/Levels

Level/Layer Naming		ISO Format		Level/Layer Description		Graphic Details		Model File Types				
AIA Format	ISO Format					Line Style	Line Width (mm)	AutoCAD Color #	MicroStation Color #	Floor Patterns	Elevations	Details
<b>General Information</b>												
I-ANNO-DIMS	I----DIP-	Witness/extension lines, dimension terminators, dimension text		0	V	V	V	V	V	X	X	X
I-ANNO-KEYN	I----KEP-	Reference keynotes with associated leader;		0	V	V	V	V	V	X	X	X
I-ANNO-NOTE	I----NOP-	General notes and general remarks		0	0.35	2	4	X	X	X	X	X
I-ANNO-NPLT	I----NPP-	Non-printing graphic information		0	0.18	5	1	X	X	X	X	X
I-ANNO-PATT	I----PAP-	Pattern, poche, shading, and hatching		V	0.18	8	9	X	X	X	X	X
I-ANNO-RDME	I----RDP-	Read-me information		0	0.18	5	1	X	X	X	X	X
I-ANNO-REFR	I----RFP-	Reference files (AutoCAD users only)		NA	NA	NA	NA	X	X	X	X	X
I-ANNO-SYMB	I----SYP-	Miscellaneous symbols		V	6	5	X	X	X	X	X	X
I-ANNO-TEXT	I----TEP-	Miscellaneous text and callouts with associated leader:		0	V	V	V	X	X	X	X	X
<b>Carpet/Carpet Tile</b>												
I-CRPT-ROLL-ACNT	I-CRPT-TRIM-	Carpet (roll, goods) - accent color		0	V	1	3	X	X	X	X	X
I-CRPT-ROLL-FILD	I-CRPTTRM-	Carpet (roll, goods) - field color		0	V	60	100	X	X	X	X	X
I-CRPT-TILE-ACNT1	I-CRPTT1M-	Carpet tile - accent color		0	V	208	69	X	X	X	X	X
I-CRPT-TILE-ACNT2	I-CRPTT12M-	Carpet tile - accent color		0	V	236	139	X	X	X	X	X
I-CRPT-TILE-FILD	I-CRPTTFM-	Carpet tile - field color		0	V	204	37	X	X	X	X	X
<b>Equipment</b>												
I-EQPM-ACCS	I-EQPMACM-	Equipment access		2	0.18	8	9	X	X	X	X	X
I-EQPM-CHLD	I-EQPMCHM-	Child development (play toys, teaching rugs, play forms)		0	0.35	2	4	X	X	X	X	X
I-EQPM-COPY	I-EQPMCOM-	Copiers, fax machines, office equipment		0	0.35	2	4	X	X	X	X	X
I-EQPM-FIXD	I-EQPMFIM-	Fixed equipment		0	0.18	5	1	X	X	X	X	X
I-EQPM-IDEN	I-EQPMIDM-	Equipment identification numbers		0	0.25	1	3	X	X	X	X	X
I-EQPM-MEDI	I-EQPMMEM-	Medical (exam beds, dental chairs, etc.)		0	0.35	2	4	X	X	X	X	X
I-EQPM-MOVE	I-EQPMOMM-	Moveable equipment		2	0.18	5	1	X	X	X	X	X
I-EQPM-OVHD	I-EQPMOVM-	Overhead, ceiling mounted, and suspended equipment		0	0.25	3	2	X	X	X	X	X
I-EQPM-STOR	I-EQPMSTM-	Storage equipment		0	0.35	2	4	X	X	X	X	X
<b>Signage</b>												
I-FLOR-SIGN	I-FLORSIM-	Signage		0	0.35	6	5	X	X	X	X	X
<b>Flooring Items and Materials</b>												
I-FLRG-MATS	I-FRGMAM-	Entrance mat components and frames		0	V	4	7	X	X	X	X	X
I-FLRG-STON	I-FRLGSTM-	Stone flooring		0	V	153	104	X	X	X	X	X
I-FLRG-TRAN	I-FRLGTRM-	All floor thresholds and transition moldings		0	V	5	1	X	X	X	X	X
I-FLRG-WOOD	I-FRLGWOM-	Wood parquet tile or planks		0	V	22	22	X	X	X	X	X
<b>Furnishings</b>												
I-FURN-ACCS	I-FURNACM-	Accessories (vestibule mats, partitions, draperies, clocks, trash cans, lecterns, lamps, etc.)		0	0.25	1	3	X	X	X	X	X
I-FURN-ADPC	I-FURNADM-	Automated Data Processing Components		0	0.35	2	4	X	X	X	X	X
I-FURN-ARTW	I-FURNART-	Artwork		0	0.35	2	4	X	X	X	X	X
I-FURN-FLOR	I-FURNFLM-	Flooring (carpet, rugs, etc.)		0	0.35	2	4	X	X	X	X	X
I-FURN-FREE	I-FURNFRM-	Free-standing furnishings (desks, beds, tables, dressers, credenzas, casegoods)		0	0.35	6	5	X	X	X	X	X
I-FURN-GRID	I-FURNGRM-	Planning grid/modular outline		0	0.50	4	7	X	X	X	X	X
I-FURN-IDEN	I-FURNIDM-	Furniture code identification		0	0.25	3	2	X	X	X	X	X
I-FURN-PLNT	I-FURNPLM-	Plants		0	0.25	3	2	X	X	X	X	X
I-FURN-SEAT	I-FURNSEM-	Seating (chairs, sofas, etc.)		0	0.35	2	4	X	X	X	X	X
I-FURN-STOR	I-FURNSTM-	File cabinets, high density storage, shelving, storage cabinet:		0	0.35	2	4	X	X	X	X	X
<b>Poilecast or Broadcast Flooring</b>												
I-MONO-SRELACNT	I-MONOSAM-	Seamless resinous flooring - accent color		0	V	203	45	X	X	X	X	X
I-MONO-SRFL-FILD	I-MONOSMF-	Seamless resinous flooring - field color		0	V	9	14	X	X	X	X	X
I-MONO-TERRACNT1	I-MONOT1M-	Terrazzo - accent color		0	V	144	199	X	X	X	X	X

**Discipline: Interiors**  
**Model File Layers/Levels**

Level/Layer Naming		AIA Format	ISO Format	Level/Layer Description	Graphic Details		Model File Types
Level	Layer				Line Style	MicroStation Color #	
I-MONO-TERR-ACN2	I-MONOT2M-	I-SYST-FURN	I-SYSTID-M-	Furniture	0	0	X
I-MONO-TERR-FILD	I-MONOTFM-	I-SYST-IDEN	I-SYSTIDPL-	Code identification components	0	0	X
		I-SYST-IDPL	I-SYSTIPM-	Code identification panels	0	0	X
		I-SYST-LITE	I-SYSTLIM-	Lighting components	0	0	X
		I-SYST-PATT	I-SYSTPAM-	Patterns	0	0	X
		I-SYST-PNLIS	I-SYSTPNM-	Panel	0	0	X
		I-SYST-POWER	I-SYSTPOM-	Power, communication components	0	0	X
		I-SYST-STOR	I-SYSTSTM-	Storage components	0	0	X
		I-SYST-WALL	I-SYSTWAM-	System furniture partition walls	0	0	X
		I-SYST-WKSF	I-SYSTWKW-	Work surface components	0	0	X
<b>System Furniture</b>							
I-TILE-CERM-ACNT	I-TILECAM-	I-TILECAM-	Ceramic mosaic tile - accent color	0	0	0	X
I-TILE-CERM-FILD	I-TILECFM-	I-TILECFM-	Ceramic mosaic tile - field color	0	0	0	X
I-TILE-LINO-ACNT	I-TILELAM-	I-TILELAM-	Linoem tile - accent color	0	0	0	X
I-TILE-LINO-FILD	I-TILELFM-	I-TILELFM-	Linoem tile - field color	0	0	0	X
I-TILE-PORC-ACN1	I-TILEP1M-	I-TILEP1M-	Porcelain tile - accent color	0	0	0	X
I-TILE-PORC-ACN2	I-TILEP2M-	I-TILEP2M-	Porcelain tile - accent color	0	0	0	X
I-TILE-QUAR-CILD	I-TILEPFM-	I-TILEPFM-	Porcelain tile - field color	0	0	0	X
I-TILE-QUAR-ACNT	I-TILEQAM-	I-TILEQAM-	Quarry tile - accent color	0	0	0	X
I-TILE-QUAR-FILD	I-TILEQFM-	I-TILEQFM-	Quarry tile - field color	0	0	0	X
I-TILE-RUBB-ACNT	I-TILERAM-	I-TILERAM-	Rubber tile - accent color	0	0	0	X
I-TILE-RUBB-FILD	I-TILERFM-	I-TILERFM-	Rubber tile - field color	0	0	0	X
I-TILE-TERR-ACN1	I-TILET1M-	I-TILET1M-	Terrazzo tile - accent color	0	0	0	X
I-TILE-TERR-ACN2	I-TILET2M-	I-TILET2M-	Terrazzo tile - accent color	0	0	0	X
I-TILE-TERR-ACN3	I-TILET3M-	I-TILET3M-	Terrazzo tile - accent color	0	0	0	X
I-TILE-TERR-FILD	I-TILETFM-	I-TILETFM-	Terrazzo tile - field color	0	0	0	X
I-TILE-VINY-ACN1	I-TILEV1M-	I-TILEV1M-	Vinyl or Vinyl composition tile - accent color	0	0	0	X
I-TILE-VINY-ACN2	I-TILEV2M-	I-TILEV2M-	Vinyl or Vinyl composition tile - accent color	0	0	0	X
I-TILE-VINY-FILD	I-TILEVFM-	I-TILEVFM-	Vinyl or Vinyl composition tile - field color	0	0	0	X
<b>Elevations</b>							
I-ELEV-CASE	I-ELEVCM-	I-ELEVCM-	Wall mounted casework	0	0	0	X
I-ELEV-FXT	I-ELEVFM-	I-ELEVFM-	Plumbing fixtures	0	0	0	X
I-ELEV-FNSH	I-ELEVFM-	I-ELEVFM-	Finishes, woodwork, and trim	0	0	0	X
I-ELEV-IDEN	I-ELEVIDM-	I-ELEVIDM-	Component identification numbers	0	0	0	X
I-ELEV-PATT	I-ELEVPM-	I-ELEVPM-	Textures and hatch patterns	0	0	0	X
I-ELEV-SIGN	I-ELEVSM-	I-ELEVSM-	Signage	0	0	0	X
<b>Detail Information</b>							
I-DETL-GRPH	I-DETLGFM-	I-DETLGFM-	Graphics, gridlines, non-text items	0	0	0	X
I-DETL-IDND	I-DETINFM-	I-DETINFM-	Inch/pound specific dimensions and notes	0	0	0	X
I-DETL-METR	I-DETMFM-	I-DETMFM-	Metric specific dimensions and notes	0	0	0	X

Note: V = Varies, NA = Not Applicable  
Patterning used within each material to differentiate colors shall match the color and level of the material.

## **Discipline: Fire Protection Model File Layers/Levels**

Level/Layer Naming				Graphic Details		Model File Types	
AIA Format	ISO Format	Level/Layer Description		Line Style	MicroStation Color #	Fire Alarm/Detection Plan	Fire Suppression Plan
General Information				Line Width (mm)	AutoCAD Color #	Life Safety Plan	Details
F-ANNO-DIMS	F----DIP-	Witnesses/extension lines, dimension terminators, dimension text		0	V	V	X
F-ANNO-KEYN	F----KEP-	Reference keynotes with associated leader:		0	V	V	X
F-ANNO-NOTE	F----NOP-	General notes and general remarks		0	0.35	2	X
F-ANNO-NPLT	F----NPP-	Non-printing graphic information		0	0.18	5	X
F-ANNO-PATT	F----PAP-	Patterned, poche, shading, and hatching		V	0.18	8	X
F-ANNO-RDME	F----RDP-	Read-me information		0	0.18	5	X
F-ANNO-REFR	F----RFP-	Reference files (AutoCAD users only)		NA	NA	NA	X
F-ANNO-SYMB	F----SYP-	Miscellaneous symbols:		V	V	6	X
F-ANNO-SYMB	F----TEP-	Miscellaneous text and callouts with associated leader:		0	V	V	X
F-ANNO-TEXT	F----TEXT			0	V	V	X
<b>Aqueous Film Forming Foam System</b>				0	0.35	82	X
F-AFFF-EQPM	F-AFFF-EQFM-	Equipment		0	0.35	82	X
F-AFFF-PIPE	F-AFFF-PIPM-	Piping		0	0.35	82	X
<b>CO2 Sprinkler System</b>				0	0.35	6	X
F-CO2S-EQPM	F-CO2SEQFM-	Equipment		0	0.35	6	X
F-CO2S-PIPE	F-CO2SPIM-	CO2 piping or CO2 discharge nozzle piping		0	0.35	6	X
<b>Control Panels</b>				0	0.35	6	X
F-CTRL-PANL	F-CTRLPAM-	Control panels		0	0.35	23	X
<b>Floor Information</b>				0	0.35	2	X
F-FLOOR-IDEN	F-FLOORIDM-	Room name, space identification text copied from Architectural - Floor Plan model		0	0.25	3	X
F-FLOOR-NUMB	F-FLOORNUM-	Room/space identification number and symbol (copied from Architectural - Floor Plan model file)		0	0.25	3	X
<b>Halon System</b>				0	0.35	22	X
F-HALNEQPM	F-HALNEQFM-	Equipment		0	0.35	22	X
F-HALN-PIPE	F-HALNPIM-	Piping		0	0.35	22	X
<b>Inert Gas</b>				0	0.35	22	X
F-GAS-EQPM	F-GASEQFM-	Equipment		0	0.35	162	X
F-GAS-PIPE	F-GASSPIM-	Piping		0	0.35	162	X
<b>Means of Egress Lighting</b>				0	0.35	162	X
F-LITE-EMER	F-LITEEMM-	Emergency fixtures		0	0.50	23	X
F-LITE-EXIT	F-LITEEXM-	Exit fixtures		0	0.50	203	X
<b>Egress Requirements</b>				0	0.35	6	X
F-LSFT-EGRE	F-LSFTEGM-	Egress requirements designator		0	0.35	6	X
F-LSFT-OCCP	F-LSFTOCM-	Occupant load for egress capacity		0	0.35	6	X
F-LSFT-TRVL	F-LSFTTRW-	Maximum travel distances		0	0.35	6	X
<b>Fire Protection/Suppression/Alarm/Detection Equipment</b>				0	0.50	83	X
F-PROT-ALRMINDC	F-PROTALRMM-	Indicating appliances		0	0.50	23	X
F-PROT-ALRMANL	F-PROTALRMM-	Manual fire alarm pull stations		0	0.35	2	X
F-PROT-EXTN	F-PROTEXM-	Fire extinguishers		0	0.35	2	X
F-PROT-EXTNCABN	F-PROTECM-	Fire extinguisher cabinets		0	0.35	2	X
F-PROT-HOSE	F-PROTHOM-	Fire hoses		0	0.35	2	X
F-PROT-HOCABN	F-PROTHOCM-	Fire hose cabinets		0	0.35	2	X
F-PROT-SMOK	F-PROTSMW-	Smoke detectors and heat sensor		0	0.50	23	X
<b>Fire Ratings</b>				0	0.50	4	X
F-RATE-DOOR	F-RATEDOM-	Door fire ratings		0	0.50	4	X
F-RATE-WALL	F-RATEWAM-	Wall fire ratings		0	0.50	4	X
<b>Smoke/Pressurization Control</b>				0	0.50	4	X

**Discipline: Fire Protection**  
**Model File Layers/Levels**

Level/Layer Naming		AIA Format	ISO Format	Level/Layer Description	Graphic Details		Model File Types		Details
F-SMOK-DNF/R	F-SMOKDMM-				Line Style	Line Width (mm)	MicroStation Color #	AutoCAD Color #	
<b>Sprinkler System</b>									
F-SPRN-CLHD	F-SPRNCLM-	Sprinkler - ceiling heads	0	0.35	22	22	X		
F-SPRN-OTHD	F-SPRNOM-	Sprinkler - other heads	0	0.35	122	23	X		
F-SPRN-PIPE	F-SPRNPM-	Sprinkler piping	0	0.35	122	23	X		
F-SPRN-STAN	F-SPRNSTM-	Standpipe system	0	0.35	122	23	X		
<b>Water Supply and Distribution</b>									
F-WATR-CONN	F-WATRCOM-	Fire department connections	0	0.35	122	23	X		
F-WATR-HDR	F-WATHYR-	Hydrants	0	0.35	122	23	X		
F-WATR-PIPE	F-WATRPM-	Piping	FIRE	0.50	4	7	X		
F-WATR-PUMP	F-WATRPUM-	Fire pumps	0	0.35	122	23	X		
<b>Detail Information</b>									
F-DETL-GRPH	F-DETLGRM-	Graphics, gridlines, non-text items	V	V	V	V	X		
F-DETL-NPDI	F-DETLINM-	Inch-pound specific dimensions and notes	0	V	V	V	X		
F-DETL-METR	F-DETLMEV-	Metric specific dimensions and notes	0	V	V	V	X		

Note: V = Varies, NA = Not Applicable

**Discipline: Plumbing**  
Model File Layers/Levels

Level/Layer Naming		ISO Format	Level/Layer Description	Graphic Details				Model File Types			
AIA Format	ISO Format			Line Style	Line Width (mm)	AutoCAD Color #	MicroStation Color #	Piping Plan	Riser Diagrams	Details	Piping Plan
<b>General Information</b>											
P-ANNO-DIMS	P-----DIP-		Witness/extension lines, dimension terminators, dimension text	0	0	V	V	X	X	X	X
P-ANNO-KEYN	P----KEP-		Reference keynotes with associated leader	0	0	V	V	X	X	X	X
P-ANNO-NOTE	P----NOP-		General notes and general remarks	0	0	0.35	2	4	X	X	X
P-ANNO-NPLT	P----NPP-		Non-printing graphic information	0	0.18	5	1	X	X	X	X
P-ANNO-PATT	P----PAP-		Patterned, poche, shading, and hatching	0	0.18	8	9	X	X	X	X
P-ANNO-RDME	P----RDP-		Referencing information	0	0.18	5	1	X	X	X	X
P-ANNO-REFR	P----REFP-		Reference files (AutoCAD users only)	NA	NA	NA	NA	X	X	X	X
P-ANNO-SYMB	P----SYF-		Miscellaneous symbols	V	V	6	5	X	X	X	X
P-ANNO-TEXT	P----TEP-		Miscellaneous text and callouts with associated leader	0	0	V	V	X	X	X	X
<b>Domestic Water System</b>											
P-DOMW-CPIP	P-DOMW-CFPN-	Cold water piping		CLDWTR	0.50	123	31	X	X	X	X
P-DOMW-EQPM	P-DOMW-ECPM-	Hot and cold water equipment			0	0.70	7	0	X	X	X
P-DOMW-EQPM-ACCS	P-DOMW-EQPM-ACCS-	Equipment access doors			0	0.35	82	18	X	X	X
P-DOMW-FPIP	P-DOMW-FPM-	Domestic filtered water piping			0	0.50	83	42	X	X	X
P-DOMW-HPIP	P-DOMW-HPM-	Hot water piping		HWTTR,	0.50	113	16	X	X	X	X
P-DOMW-RISR	P-DOMW-RIM-	Hot and cold water risers		HWTTR	0.50	113	16	X	X	X	X
<b>Floor Information</b>											
P-FLOR-IDEN	P-FLORDIM-	Room name, space identification text (copied from Architectural - Floor Plan model)		0	0.25	3	2	X	X	X	X
P-FLOR-NUMB	P-FLORNUMM-	Room/space identification number and symbol (copied from Architectural - Floor Plan model file)		0	0.25	3	2	X	X	X	X
<b>Laboratory Gas Piping</b>											
P-LGAS-PIPE	P-LGASPIM-	Piping	Equipment	OXYGEN, NITROGEN, HELIUM, HYDROGEN, ACIDWSS,	0	0.70	24	38	X	X	X
P-LGAS-FQPM	P-LGASEQFM-										
<b>Medical/Dental Gas Piping</b>											
P-MDGSECPM	P-MDGSECIM-	Equipment		NITROGEN, NITROG, HELIUM, HYDROGEN, ACIDWSS,	0	0.70	24	38	X	X	X
P-MDGSNITG	P-MDGSNITG-	Nitrogen piping			NITROG	0.50	23	46	X	X	X
P-MDGSONXG	P-MDGSONXG-	Nitrous oxide piping			NITOXI	0.50	23	46	X	X	X
P-MDGSOXYG	P-MDGSOXYG-	Pure O2 piping			OXYGEN	0.50	23	46	X	X	X
P-MDGSSAIR	P-MDGSSAIR-	Scavenging air			0	0.50	23	46	X	X	X
P-MDGSVACU	P-MDGSVACU-	Medical vacuum piping			VACAIR	0.50	23	46	X	X	X
<b>Penetrations</b>											
P-PENE-FLOOR	P-PENEFLM-	Floor penetrations			2	0.25	3	2	X	X	X
P-PENE-ROOF	P-PENEROM-	Roof penetrations			2	0.25	1	3	X	X	X
P-PENE-WALL	P-PENEWAM-	Wall penetrations			2	0.25	1	3	X	X	X
<b>Sanitary Drainage System</b>											
P-SANR-COND	P-SANRCOM-	Condensate piping			0	0.50	83	42	X	X	X
P-SANR-EQPM	P-SANREQM-	Equipment (e.g., sand/oil/water separators)			0	0.70	204	37	X	X	X
P-SANR-FLDR	P-SANRFIM-	Floor drains, sinks, and cleanouts			0	0.35	6	5	X	X	X
P-SANR-PIPE	P-SANRPM-	Piping			SSWAF	0.50	203	45	X	X	X
P-SANR-RISR	P-SANRIM-	Sanitary risers			2	0.50	203	45	X	X	X

**Discipline: Plumbing**  
**Model File Layers/Levels**

Level/Layer Naming		AIA Format		ISO Format		Level/Layer Description		Graphic Details		Model File Types	
P-SANR-VENT	P-SANR/EM-	Vent piping						VENT	0.50	203	45
P-STRM-PIPE	P-STRMPIM-	Storm drain piping						STRAF	0.50	163	41
P-STRM-RFDR	P-STRMRFM-	Roof drains						ROOFDN	0.50	163	41
P-STRM-RFSR	P-STRMRFM-	Storm drain risers						2	0.50	163	41
<b>Diagram Information</b>											
P-DIAG-GRPH	P-DIAGGRM-	Graphics, gridlines, non-text items						V	V	V	V
P-DIAG-INPD	P-DIAGINM-	Inch-bound specific dimensions and notes						0	V	V	V
P-DIAG-METR	P-DIAGMEM-	Metric specific dimensions and notes						0	V	V	V
<b>Detail Information</b>											
P-DETL-GRPH	P-DETLGRM-	Graphics, gridlines, non-text items						V	V	V	V
P-DETL-INPD	P-DETLINM-	Inch-bound specific dimensions and notes						0	V	V	V
P-DETL-METR	P-DETLMEM-	Metric specific dimensions and notes						0	V	V	V

Note: V = Varies, NA = Not Applicable

**Discipline: Mechanical**  
Model File Layers/Levels

Level/layer Naming		ISO Format		Level/Layer Description		Graphic Details		Model File Types			
<b>General Information</b>											
M-ANNO-DIMS	M-----DIP-			Witness/extension lines, dimension terminators, dimension text, weld symbol:		0	V	V	V	V	V
M-ANNO-KEYN	M----KEP-			Reference keynotes with associated leader:		0	V	V	V	V	V
M-ANNO-MASK	M----MAP-			Text/shape mask for use with photo backgrounds		0	0.18	113	16	X	X
M-ANNO-NOTE	M----NOF-			General notes and general remarks		0	0.35	2	4	X	X
M-ANNO-NPLT	M----NPP-			Non-printing graphic information (e.g., clearances and working space information)		0	0.18	5	1	X	X
M-ANNO-PATT	M----PAF-			Patternning, poche, shading, and hatching		V	0.18	8	9	X	X
M-ANNO-RDME	M----RDP-			Read-me information		0	0.18	5	1	X	X
M-ANNO-REFR	M----REFP-			Reference files (AutoCAD users only)		NA	NA	NA	NA	X	X
M-ANNO-SYMB	M----SYMP-			Miscellaneous symbols		V	6	5	5	X	X
M-ANNO-TEXT	M----TEP-			Miscellaneous text and callouts with associated leader:		0	V	V	V	X	X
<b>Industrial Waste Piping</b>											
M-ACID-EQPM	M-ACIDEQM-			Acid, alkaline, and oil waste equipment		0	0.35	80	11		
M-ACID-PIPE	M-ACIDPIPE-			Acid, alkaline, and oil waste piping		ACIDWS, IWASTE	0.50	80	11	X	X
M-ACID-VENT	M-ACIDVENT-			Acid, alkaline, and oil waste vent piping		2	0.50	80	11	X	X
<b>AntiFreeze</b>											
M-AFRZ-EQPM	M-AFRZEQM-			Anti-freeze equipment		0	0.35	82	18	X	X
M-AFRZ-SUPP-PIPE	M-AFRZSPM-			Anti-freeze supply piping		0	0.50	82	18	X	X
M-AFRZ-WAST-PIPE	M-AFRZWP-			Anti-freeze waste piping		0	0.50	82	18	X	X
<b>Brine System</b>											
M-BRINE-EQPM	M-BRINEQM-			Brine system equipment		0	0.35	123	31	X	X
M-BRIN-RETN-PIPE	M-BRINRPM-			Brine system return piping		BRINER	0.50	123	31	X	X
M-BRIN-SUPP-PIPE	M-BRINSPM-			Brine system supply piping		BRINES	0.50	123	31	X	X
<b>Chemical Treatment System</b>											
M-CHEM-EQPM	M-CHEMEQM-			Chemical treatment system equipment		0	0.35	123	31	X	X
M-CHEM-RETN-PIPE	M-CHEMRNM-			Chemical treatment system return piping		0	0.50	123	31	X	X
M-CHEM-SUPP-PIPE	M-CHEMSPM-			Chemical treatment system supply piping		0	0.50	123	31	X	X
<b>Compressed Air</b>											
M-CMPA-EQPM	M-CMPAECM-			Equipment		0	0.70	84	34	X	X
M-CMPA-PIPE	M-CMPAPIM-			Piping		CMPAIR	0.50	83	42	X	X
<b>Condenser Water System</b>											
M-CNNDW-EQPM	M-CNNDWECM-			Condenser water system equipment		0	0.35	83	42	X	X
M-CNNDW-RETN-PIPE	M-CNNDWRNM-			Condenser water system return piping		CONDWR	0.50	83	42	X	X
M-CNNDW-SUPP-PIPE	M-CNNDWSPM-			Condenser water system supply piping		CONDWS	0.50	83	42	X	X
<b>Controls</b>											
M-CONT-THER	M-CONTTHM-			Thermostats		0	0.25	1	3	X	X
M-CONT-WIRE	M-CONTWM-			Low voltage wiring		1.2	0.25	1	3		
<b>Chilled Water System</b>											
M-CWTTR-CNDS-PIPE	M-CWTTRCFM-			Condensate piping		CDRNFM	0.50	83	42	X	X
M-CWTTR-EQPM	M-CWTREQM-			Chilled water equipment		0	0.35	163	41	X	X
M-CWTTR-RETN-PIPE	M-CWTTRRM-			Chilled water return piping		CWR	0.50	163	41	X	X
M-CWTTR-SUPP-PIPE	M-CWTTRSMPM-			Chilled water supply piping		CWS	0.50	163	41	X	X
<b>Culvert Valves</b>											
M-CVAL-BASE	M-CVALBAM-			Culvert valve machinery base		0	0.35	2	4		
M-CVAL-BEAM	M-CVALBEM-			Culvert valve beams		0	0.35	2	4		

**Discipline: Mechanical**  
Model File Layers/Levels

Level/Layer Naming		Model File Types									
		Graphic Details					Model Details				
ISO Format	Level/Layer Description	Line Style	Line Width (mm)	AutoCAD Color #	MicroStation Color #	Section	Elevation	Machine Design	Control Diagrams	Details	
M-CVAL-CYLD	Culvert valve machinery cylinder (outline not for details)	0	0.35	80	11						
M-CVAL-SEAL	Culvert valve seals	0	0.35	3	2						
M-CVAL-SKIN	Culvert valve skin plate	0	0.35	1	3						
M-CVAL-SKRM											
M-CVAL-STIF	Stiffener plates, angles, etc.	0	0.35	4	7						
M-CVAL-TRUN	Culvert valve trunnion beam	0	0.35	6	5						
<b>Dual Temperature System</b>											
M-DUAL-EQPM	M-DUALEQM-M- Dual temperature system equipment	0	0.35	23	46						
M-DUAL-RETN-PIPE	M-DUALRPM-M- Dual temperature system return piping	DTR	0.50	23	46						
M-DUAL-SUPP-PIPE	M-DUALSPM-M- Dual temperature system supply piping	DTS	0.50	23	46						
<b>Dust and Fume Collection Systems</b>											
M-DUST-DUCT	M-DUSTDM-M- Dust and fume ductwork	0	0.50	203	45						
M-DUST-DUCT-CNTR	M-DUSTDM-M- Dust and fume ductwork centerlines	7	0.18	5	1						
M-DUST-EGPM	M-DUSTGMM-M- Dust and fume equipment	0	0.35	203	45						
M-DUST-GRIL	M-DUSTGRM-M- Dust and fume grilles	0	0.35	203	45						
<b>Exhaust Air System</b>											
M-EXHS-DUCT	M-EXHSDM-M- Exhaust ductwork	V	0.50	83	42						
M-EXHS-DUCT-CNTR	M-EXHSDM-M- Exhaust ductwork centerlines	7	0.18	5	1						
M-EXHS-EQPM	M-EXHSECMM-M- Exhaust equipment	0	0.35	83	42						
M-EXHS-GRIL	M-EXHSGRM-M- Grilles	0	0.35	83	42						
<b>Floor Information</b>											
M-FLOR-IDEN	M-FLORIDM-M- Room name, space identification text (copied from Architectural - Floor Plan model)	0	0.25	3	2						
M-FLOR-NUMB	M-FLORNUMM-M- Room/space identification number and symbol (copied from Architectural - Floor Plan model file)	0	0.25	3	2						
<b>Fuel Systems</b>											
M-FUEL-DIES-RETN	M-FUELDRM-M- Diesel fuel return piping	0	0.50	23	46						
M-FUEL-DIES-SUPP	M-FUELDSM-M- Diesel fuel supply piping	0	0.50	23	46						
M-FUEL-DIES-VENT	M-FUELDVM-M- Diesel fuel vent piping	0	0.50	23	46						
M-FUEL-EQPM	M-FUELEQM-M- Equipment	0	0.70	24	38						
M-FUEL-GGEP-LQPG	M-FUELGLMM-M- Liquid petroleum gas	LICPET	0.50	23	46						
M-FUEL-LOGEP-RETN	P-FUELOLM-M- Return oil piping	FUELOR	0.50	23	46						
M-FUEL-OGEP-SUPP	P-FUELOSM-M- Supply oil piping	FUELOS	0.50	23	46						
M-FUEL-OGEP-VENT	M-FUELOWM-M- Oil piping vent	FUELOV	0.50	23	46						
<b>Glycol System</b>											
M-GLYC-EQPM	M-GLYCEGM-M- Glycol system equipment	0	0.35	82	18						
M-GLYC-RETN-PIPE	M-GLYCRPM-M- Glycol system return piping	GHR	0.50	82	18						
M-GLYC-SUPP-PIPE	M-GLYCSPM-M- Glycol system supply piping	GHS	0.50	82	18						
<b>Geothermal Heat Pump System</b>											
M-GTHP-EQPM	M-GTHPECM-M- Geothermal heat pump system equipment	0	0.35	203	45						
M-GTHP-RETN-PIPE	M-GTHPRETM-M- Geothermal heat pump system return piping	0	0.50	203	45						
M-GTHP-SUPP-PIPE	M-GTHPSPM-M- Geothermal heat pump system supply piping	0	0.50	203	45						
<b>Hydraulic Control Systems (Hydraulic Fluid)</b>											
M-HCSF-CYLD	M-HCSFCYLM-M- Hydraulic cylinders	0	0.35	7	0						
M-HCSF-CYLD-PSTN	M-HCSFCPBM-M- Hydraulic cylinder pistons	0	0.35	5	1						
M-HCSF-CYLD-WEAR	M-HCSFCWMM-M- Wear rings	0	0.35	3	2						
M-HCSF-EQPM	M-HCSFEQMM-M- Hydraulic system equipment	0	0.35	200	13						
M-HCSFFTG	M-HCSFFTM-M- Hose and pipe fittings	0	0.35	4	7						

**Discipline: Mechanical**  
Model File Layers/Levels

Level/Layer Naming		ISO Format	Level/Layer Description	Model File Types			
Level	Layer			Graphic Details	Details		
M-HCSF-HOSE	M-HCSFHOM-M	M-HCSFHOM-M	Hydraulic hoses	Line Width (mm)	MicroStation Color #		
M-HCSF-MOTOR	M-HCSFMOT-M	M-HCSFMOT-M	Hydraulic motors and actuators	Line Width (mm)	AutoCAD Color #		
M-HCSF-OTLN	M-HCSFOTL-M	M-HCSFOTL-M	Outlines of machinery, etc. in the vicinity of the hydraulic component	Line Width (mm)	MicroStation Color #		
M-HCSF-PUMP	M-HCSFPUM-M	M-HCSFPUM-M	Hydraulic pumps and pump motors	Line Width (mm)	MicroStation Color #		
M-HCSF-RETN-PIPE	M-HCSFRTP-M	M-HCSFRTP-M	Hydraulic system return piping	Line Width (mm)	MicroStation Color #		
M-HCSF-ROOM	M-HCSFROM-M	M-HCSFROM-M	Floor, walls, etc. that hydraulic system attaches to	Line Width (mm)	MicroStation Color #		
M-HCSF-SCHM-MISC	M-HCSFSHM-M	M-HCSFSHM-M	Miscellaneous schematic figures (i.e., common location lines	Line Width (mm)	MicroStation Color #		
M-HCSF-SRPT	M-HCSFSRP-M	M-HCSFSRP-M	Pipe supports, hangers, etc.	Line Width (mm)	MicroStation Color #		
M-HCSF-SUP-PIPE	M-HCSFSUP-M	M-HCSFSUP-M	Hydraulic system supply piping	Line Width (mm)	MicroStation Color #		
M-HCSF-VALV	M-HCSFVLM-M	M-HCSFVLM-M	Hydraulic valves	Line Width (mm)	MicroStation Color #		
M-HCSF-VALV-CONT	M-HCSFVOM-M	M-HCSFVOM-M	Hydraulic directional control valves	Line Width (mm)	MicroStation Color #		
M-HCSF-VALV-FLOW	M-HCSFVFIM-M	M-HCSFVFIM-M	Flow control valves, check valves, etc.	Line Width (mm)	MicroStation Color #		
M-HCSF-VALV-PRES	M-HCSFVPIM-M	M-HCSFVPIM-M	Pressure control valves; relief valves, counterbalance valves, etc	Line Width (mm)	MicroStation Color #		
M-HCSF-VALV-SOFT	M-HCSFVSP-M	M-HCSFVSP-M	Hydraulic shutdown type valves (ball, gate, etc.)	Line Width (mm)	MicroStation Color #		
<b>Hydraulic Control Systems (Water)</b>							
M-HCSW-DEV/C	M-HCSWDEMC-M	M-HCSWDEMC-M	Stilling wells, rigid anchors, anchor guides, rectifiers, reducers, markers, meters, regulators, tanks, and valves	Line Width (mm)	MicroStation Color #		
M-HCSW-DEV/C-IDEN	M-HCSWDEVIDN-M	M-HCSWDEVIDN-M	Device identifiers	Line Width (mm)	MicroStation Color #		
M-HCSW-EQPM-ACCS	M-HCSWEAM-M	M-HCSWEAM-M	Equipment access doors	Line Width (mm)	MicroStation Color #		
M-HCSW-PUMP	M-HCSWPUM-M	M-HCSWPUM-M	Pump station equipment	Line Width (mm)	MicroStation Color #		
M-HCSW-PUMP-FLOW	M-HCSWPFP-M	M-HCSWPFP-M	Flow direction arrows	Line Width (mm)	MicroStation Color #		
M-HCSW-PUMP-FTTG	M-HCSWPFTG-M	M-HCSWPFTG-M	Caps and flanges	Line Width (mm)	MicroStation Color #		
M-HCSW-PUMP-IDEN	M-HCSWPMPIDN-M	M-HCSWPMPIDN-M	Pump identifier tags, symbol modifiers, and text	Line Width (mm)	MicroStation Color #		
M-HCSW-PUMP-PIPE	M-HCSWPMP-M	M-HCSWPMP-M	Pump piping (includes fittings and valves)	Line Width (mm)	MicroStation Color #		
<b>High Temperature/Chilled Water System</b>							
M-HTCW-ABND-PIPE	M-HTCWABNP-M	M-HTCWABNP-M	Abandoned piping	Line Width (mm)	MicroStation Color #		
M-HTCW-CWTR-MAIN	M-HTCWCWTR-M	M-HTCWCWTR-M	Main chilled water piping	Line Width (mm)	MicroStation Color #		
M-HTCW-CWTR-PLNT	M-HTCWCWTRPLN-M	M-HTCWCWTRPLN-M	Chilled water plant	Line Width (mm)	MicroStation Color #		
M-HTCW-CWTR-SERV	M-HTCWCWTRSERV-M	M-HTCWCWTRSERV-M	Chilled water service piping	Line Width (mm)	MicroStation Color #		
M-HTCW-DEV/C	M-HTCWDPMC-M	M-HTCWDPMC-M	Rigid anchors, anchor guides, rectifiers, reducers, markers, meters, pumps, regulators, tanks, and valves	Line Width (mm)	MicroStation Color #		
M-HTCW-FLOW	M-HTCWFLOW-M	M-HTCWFLOW-M	Flow direction arrows	Line Width (mm)	MicroStation Color #		
M-HTCW-FTTG	M-HTCWFPTG-M	M-HTCWFPTG-M	Caps and flanges	Line Width (mm)	MicroStation Color #		
M-HTCW-HWTR-MAIN	M-HTCWHWTRM-M	M-HTCWHWTRM-M	Main high temperature piping	Line Width (mm)	MicroStation Color #		
M-HTCW-HWTR-PLNT	M-HTCWHWTRPLN-M	M-HTCWHWTRPLN-M	High temperature water plant	Line Width (mm)	MicroStation Color #		
M-HTCW-HWTR-SERV	M-HTCWHWTRS-M	M-HTCWHWTRS-M	High temperature service piping	Line Width (mm)	MicroStation Color #		
M-HTCW-IDEN	M-HTCWIIDN-M	M-HTCWIIDN-M	Identifier tags, symbol modifiers, and text	Line Width (mm)	MicroStation Color #		
M-HTCW-JBOX	M-HTCWCJBX-M	M-HTCWCJBX-M	Junction boxes, manholes, handholes, test boxes	Line Width (mm)	MicroStation Color #		
M-HTCW-LWTR-MAIN	M-HTCWLWTRM-M	M-HTCWLWTRM-M	Main low temperature piping	Line Width (mm)	MicroStation Color #		
M-HTCW-LWTR-SERV	M-HTCWLWTRS-M	M-HTCWLWTRS-M	Low temperature service piping	Line Width (mm)	MicroStation Color #		
M-HTCW-PIITS	M-HTCWPITM-M	M-HTCWPITM-M	Valve pits/vaults, steam pits	Line Width (mm)	MicroStation Color #		
M-HTCW-PLNT-IDEN	M-HTCWPNTIDN-M	M-HTCWPNTIDN-M	Water plant identifier tags, symbol modifiers, and text	Line Width (mm)	MicroStation Color #		
M-HTCW-RETN-PIPE	M-HTCWRRETNP-M	M-HTCWRRETNP-M	Return for all HTCW lines	Line Width (mm)	MicroStation Color #		
M-HTCW-STEM-MAIN	M-HTCWSMM-M	M-HTCWSMM-M	Main steam piping	Line Width (mm)	MicroStation Color #		
M-HTCW-STEM-SERV	M-HTCWSMS-M	M-HTCWSMS-M	Steam service piping	Line Width (mm)	MicroStation Color #		
M-HTCW-STNS-IDEN	M-HTCWSNTIDN-M	M-HTCWSNTIDN-M	Pump station identifier tags, symbol modifiers, and text	Line Width (mm)	MicroStation Color #		

Discipline: Mechanical  
Model File Layers/Levels

Level/Layer Naming		ISO Format		Level/Layer Description		Graphic Defaults		Model File Types	
Level	Layer	ISO Format	ISO Format	Level	Layer	Line Style	Line Width (mm)	AutoCAD Color #	MicroStation Color #
M-M-HTCW-STNS-PUMP	M-HTCWSPM					0	0.35	6	5
<b>HVAC System</b>									
M-HVAC-ACCCS	M-HVACACCM	M-HVAC-AC	M-HTCW-AC	M-HVAC-AC	M-HTCW-AC	0	0.12	0.25	3
M-HVAC-CDFFF	M-HVAC-CDMM	M-HVAC-CD	M-HTCW-CD	M-HVAC-CD	M-HTCW-CD	0	0.35	20	6
M-HVAC-DMPR	M-HVAC-EQPM	M-HVAC-EQ	M-HTCW-EQ	M-HVAC-EQ	M-HTCW-EQ	0	0.25	1	3
M-HVAC-EQPM	M-HVAC-EQFM	M-HVAC-EQ	M-HTCW-EQ	M-HVAC-EQ	M-HTCW-EQ	0	0.35	2	4
M-HVAC-EQFM	M-HVAC-EQPM-EFAN	M-HVAC-EQ	M-HTCW-EQ	M-HVAC-EQ	M-HTCW-EQ	0	0.35	2	4
M-HVAC-EQPM-EFIP	M-HVAC-EQPM-EPFM	M-HVAC-EQ	M-HTCW-EQ	M-HVAC-EQ	M-HTCW-EQ	0	0.35	2	4
M-HVAC-EQPM-EPFM	M-HVAC-EPFM	M-HVAC-EP	M-HTCW-EP	M-HVAC-EP	M-HTCW-EP	0	0.35	2	4
M-HVAC-EPFM	M-HVAC-EQPM-FLOOR	M-HVAC-ELM	M-HTCW-ELM	M-HVAC-EL	M-HTCW-EL	0	0.35	2	4
M-HVAC-EQPM-FLOOR	M-HVAC-EQPSM-SUPP	M-HVAC-ESM	M-HTCW-ESM	M-HVAC-ES	M-HTCW-ES	0	0.35	2	4
M-HVAC-ESM-SUPP	M-HVAC-FDFFF	M-HVAC-FDFM	M-HTCW-FDFM	M-HVAC-FDF	M-HTCW-FDF	0	0.35	162	33
M-HVAC-FDFFF	M-HVAC-JDEN	M-HVACIDM	M-HTCW-IDM	M-HVAC-IDEN	M-HTCW-IDEN	0	0.35	6	5
M-HVAC-IDEN	M-HVAC-RDFF	M-HVACRDM	M-HTCW-RDM	M-HVAC-RDFF	M-HTCW-RDFF	0	0.35	23	46
M-HVAC-RDFF	M-HVAC-RETN	M-HVACRETN	M-HTCWRETN	M-HVAC-RETN	M-HTCWRETN	V	0.50	23	46
M-HVAC-RETN	M-M-HVAC-RETNCNTR	M-HVACRCM	M-HTCWRCM	M-M-HVAC-RETNCNTR	M-M-HVACRCM	7	0.18	5	1
M-M-HVAC-RETNCNTR	M-HVAC-ROOF	M-HVACROM	M-HTCWROM	M-HVAC-ROOF	M-HTCWROOF	0	0.35	2	4
M-HVAC-ROOF	M-HVAC-SUPP	M-HVACSUM	M-HTCWSUM	M-HVAC-SUPP	M-HTCWSUPP	V	0.50	4	7
M-HVAC-SUPP	M-M-HVAC-SUPPCNTR	M-HVACSCM	M-HTCWCSCM	M-M-HVAC-SUPPCNTR	M-M-HVACSCM	7	0.18	5	1
M-M-HVAC-SUPPCNTR	M-M-HVAC-SUPP-HDUC	M-HVACSHM	M-HTCWSHM	M-M-HVAC-SUPP-HDUC	M-M-HVACSHM	V	0.50	4	7
M-M-HVAC-SUPP-HDUC	M-M-HVAC-SUPPLDUC	M-HVACSLM	M-HTCWSLM	M-M-HVAC-SUPPLDUC	M-M-HVACSLM	V	0.50	4	7
M-M-HVAC-SUPPLDUC	M-HVACTAM	M-HVACTAM	M-HTCWTAM	M-HVACTAM	M-HTCWTAM	0	0.35	6	5
M-HVACTAM	M-HVAC-WDFF	M-HVACWDM	M-HTCWWDM	M-HVAC-WDFF	M-HTCWWDM	0	0.35	2	4
<b>Hot Water Heating System</b>									
M-HWTREQPM	M-HVTREQM	M-HVTRREQM	M-HTWTRREQM	M-HVTRREQM	M-HTWTRREQM	0	0.35	113	16
M-HWTREQPM	M-HWTR-RETN-PIPE	M-HWTR-RETN-PIPE	M-HTWTR-RETN-PIPE	M-HWTR-RETN-PIPE	M-HTWTR-RETN-PIPE	HWR	0.50	113	16
M-HWTR-RETN-PIPE	M-HWTR-SUPP-PIPE	M-HWTR-SUPP-PIPE	M-HTWTR-SUPP-PIPE	M-HWTR-SUPP-PIPE	M-HTWTR-SUPP-PIPE	HWS	0.50	113	16
<b>Insulating Transformer) Oil System</b>									
M-INSLEQPM	M-INSLEQMV	M-INSLEQMV	M-INSLEQMV	M-INSLEQPM	M-INSLEQMV	0	0.35	200	13
M-INSLEQPM	M-INSL-RETN-PIPE	M-INSLRPM	M-INSLRPM	M-INSL-RETN-PIPE	M-INSLRPM	0	0.50	200	13
M-INSL-RETN-PIPE	M-INSL-SUPP-PIPE	M-INSLSPM	M-INSLSPM	M-INSL-SUPP-PIPE	M-INSLSPM	0	0.50	200	13
M-INSL-SUPP-PIPE	M-LUBE-EQPM	M-LUBEEQM	M-LUBEEQM	M-LUBE-EQPM	M-LUBEEQM	0	0.35	200	13
M-LUBE-EQPM	M-LUBE-RETN-PIPE	M-LUBERPM	M-LUBERPM	M-LUBE-RETN-PIPE	M-LUBERPM	0	0.50	200	13
M-LUBE-RETN-PIPE	M-LUBE-SUPP-PIPE	M-LUBESPBM	M-LUBESPBM	M-LUBE-SUPP-PIPE	M-LUBESPBM	0	0.50	200	13
<b>Machine Design</b>									
M-MACH-AXLE	M-MACHX-AXLE	M-MACHX-AXLE	M-MACHX-AXLE	M-MACH-AXLE	M-MACHX-AXLE	0	0.35	2	4
M-MACH-BASE	M-MACH-BASE	M-MACHB- BASE	M-MACHB- BASE	M-MACH-BASE	M-MACHB- BASE	0	0.35	2	4
M-MACH-BEAR	M-MACH-BEAR	M-MACHB-BEAR	M-MACHB-BEAR	M-MACH-BEAR	M-MACHB-BEAR	0	0.35	2	4
M-MACH-BELT	M-MACH-BELT	M-MACHBLM	M-MACHBLM	M-MACH-BELT	M-MACHBLM	0	0.35	22	22
M-MACH-BSHG	M-MACH-BSHG	M-MACHBSM	M-MACHBSM	M-MACH-BSHG	M-MACHBSM	0	0.35	2	4
M-MACH-CLEV	M-MACH-CLEV	M-MACHCLM	M-MACHCLM	M-MACH-CLEV	M-MACHCLM	0	0.35	22	22
M-MACH-COMP	M-MACH-COMP	M-MACHCOM	M-MACHCOM	M-MACH-COMP	M-MACHCOM	0	0.35	2	4
M-MACH-COVR	M-MACH-COVR	M-MACHCVM	M-MACHCVM	M-MACH-COVR	M-MACHCVM	0	0.35	4	7
M-MACH-FSTN	M-MACH-FSTN	M-MACHFSM	M-MACHFSM	M-MACH-FSTN	M-MACHFSM	0	0.35	2	4
M-MACH-GEAR	M-MACHGEAR	M-MACHGEA	M-MACHGEA	M-MACH-GEAR	M-MACHGEA	0	0.35	6	5
M-MACH-GEAR	M-MACHGEAR	M-MACHGEA	M-MACHGEA	M-MACH-GEAR	M-MACHGEA	0	0.35	6	5

**Discipline: Mechanical**  
Model File Layers/Levels

Level/Layer Naming		Model File Types									
		Graphic Details					Model Details				
AlA Format	ISO Format	Level/Layer Description		Line Style		Line Width (mm)		MicroStation Color #		AutoCAD Color #	
M-MACH-LROT	M-MACH-LROT	Large rotating machinery (turbine and pump outlines)		0	0.35	6	5				
M-MACH-MOTR	M-MACH-MOTR	Machinery motors		0	0.35	6	5				
M-MACH-PINS	M-MACH-PINS	Machinery pins		0	0.35	6	5				
M-MACH-PULL	M-MACH-PULL	Pulleys, drums, and sheaves		0	0.35	22	22				
M-MACH-RAIL	M-MACH-RAIL	Rails (e.g., crane rails, rail hoods, splice plates, etc.)		0	0.35	22	22				
M-MACH-ROLL	M-MACH-ROLL	Rollers and wheels		0	0.35	22	22				
M-MACH-ROLL-TRAK	M-MACH-ROLL-TRAK	Roller tracks		0	0.35	22	22				
M-MACH-SEAL	M-MACH-SEAL	Seals		0	0.35	22	22				
M-MACH-SHOE	M-MACH-SHOE	Sliding shoes, skids, etc.		0	0.35	22	22				
M-MACH-SPRT	M-MACH-SPRT	Support brackets		0	0.35	2	4				
M-MACH-SPRG	M-MACH-SPRG	Springs		0	0.35	22	22				
<b>Mixed Air System</b>											
M-MAIR-DUCT	M-MAIRDUM-	Mixed air ductwork		0	0.50	7	0				
M-MAIR-DUCT-CNTR	M-MAIRDUM-	Mixed air ductwork centerlines		7	0.18	5	1				
M-MAIREQPM	M-MAIREQPM-	Mixed air equipment		0	0.35	7	0				
<b>Material Handling Equipment</b>											
M-MATL-CRAN	M-MATLCRM-	Cranes		0	0.35	2	4				
M-MATL-CRAN-BOOM	M-MATLCBM-	Crane, boom		0	0.35	2	4				
M-MATL-HOIS	M-MATLHOM-	Hoists		0	0.35	2	4				
M-MATL-HOOK	M-MATLHKM-	Hooks, eyes, and other end attachment		0	0.35	2	4				
M-MATL-LIFT	M-MATLLIFT-	Miscellaneous lifting equipment		0	0.35	6	5				
M-MATL-WIRE	M-MATLWIM-	Wire rope, chains, and other hoisting medium		0	0.35	6	5				
<b>Miter Gates</b>											
M-MITR-BASE	M-MITRBAM-	Miter gate machinery base		0	0.35	2	4				
M-MITR-CLEV	M-MITRCLM-	Clevises		0	0.35	22	22				
M-MITR-CRNG	M-MITRCRM-	Cardanic ring		0	0.35	3	2				
M-MITR-CYLD	M-MITRCYLM-	Miter gate machinery cylinder (outline not for details)		0	0.35	80	11				
M-MITR-TRUN	M-MITRTRM-	Miter gate machinery turnbuckle		0	0.35	1	3				
<b>Makeup Air System</b>											
M-MKUP-DUCT	M-MKUPDUM-	Makeup air ductwork		0	0.50	2	4				
M-MKUP-DUCT-CNTR	M-MKUPDUM-	Makeup air ductwork centerlines		7	0.18	5	1				
M-MKUP-EQPM	M-MKUPEQM-	Makeup air equipment		0	0.35	2	4				
M-MKUP-GRILL	M-MKUPGRM-	Makeup air grilles		0	0.35	2	4				
<b>Natural Gas System</b>											
M-NGAS-EQPM	M-NGASEQDM-	Natural gas equipment		0	0.35	6	5				
M-NGAS-PIPE	M-NGASPM-	Natural gas piping		0	0.35	6	5				
<b>Penetrations</b>											
M-PENE-FLOOR	M-PENEFLM-	Floor penetrations		2	0.25	3	2				
M-PENE-ROOF	M-PENEROM-	Roof penetrations		2	0.25	1	3				
M-PENE-WALL	M-PENEWAM-	Wall penetrations		2	0.25	2	4				
<b>Process Piping</b>											
M-PROC-EQPM	M-PROCEQM-	Process equipment		0	0.35	120	12				
M-PROC-RETN-PIPE	M-PROCRNM-	Process return piping		0	0.50	120	12				
M-PROC-SUPP-PIPE	M-PROCSNM-	Process supply piping		0	0.50	120	12				
<b>Relief Air System</b>											
M-RAIR-DUCT	M-PAIRDUM-	Relief air ductwork		0	0.50	1	3				

**Discipline: Mechanical**  
Model File Layers/Levels

Level/Layer Naming		Graphic Details		Model File Types			
AIA Format	ISO Format	Level/Layer Description		Line Style	Line Width (mm)	AutoCAD Color #	MicroStation Color #
M-RAIR-DUCT-CNTTR	M-RAIRDGM-	Relief air ductwork centerlines		7	0.18	5	1
M-RAIR-EQPM	M-RAIREQM-	Relief air equipment		0	0.35	1	3
M-RAIR-GRIL	M-RAIRGRM-	Relief air grilles		0	0.35	1	3
<b>Energy Recovery System</b>		HTCW Utilities Plan		Machine Design			
M-RCOV-EQPM	M-RCOVEGM-	Energy recovery system equipment		0	0.35	203	45
M-RCOV-RETN-PIPE	M-RCOVRFNM-	Energy recovery system return piping		0	0.50	203	45
M-RCOV-SUPP-PIPE	M-RCOVSPNM-	Energy recovery system supply piping		0	0.50	203	45
<b>Refrigeration System</b>		HVAC Plan		Control Diagrams			
M-REFG-DISC-PIPE	M-REFGDFM-	Refrigeration system discharge		REFRD	0.50	163	41
M-REFG-EQPM	M-REFGEQM-	Refrigeration system equipment		REFRS	0.50	163	41
M-REFG-RETN-PIPE	M-REFGRNM-	Refrigeration system return piping		REFRL	0.50	163	41
M-REFG-SUPP-PIPE	M-REFGSPM-	Refrigeration system supply piping					
<b>Raw Water Piping</b>		Specialty Piping and Equipment		Hydraulic Systems			
M-RWTR-EGPM	M-RWTRTEGM-	Raw water equipment					
M-RWTR-RETN-PIPE	M-RWTRTRRNM-	Raw water return piping					
M-RWTR-SUPP-PIPE	M-RWTRTRSMM-	Raw water supply piping					
<b>Steam System</b>		Material Handling		Section Details			
M-STEM-BLBD-PIPE	M-STEMBPM-	Boiler blow down piping		BOILBD	0.50	113	16
M-STEM-CNDS-PIPE	M-STEMCMM-	Condensate piping		CDRNAF	0.50	83	42
M-STEM-EQPM	M-STEMECM-	Steam system equipment			0	0.35	113
M-STEM-HPIP-PIPE	M-STEMHPM-	High pressure steam piping		STEAMH	0.50	113	16
M-STEM-LPIP-PIPE	M-STEMLPM-	Low pressure steam piping		STEAML	0.50	1	3
M-STEM-MPIP-PIPE	M-STEMMMN-	Medium pressure steam piping		STEAMM	0.50	2	4
<b>Transfer Air System</b>		HTCW Utilities Plan		Elevations			
M-TAIR-DUCT	M-TAIRDGM-	Transfer air ductwork		0	0.50	200	13
M-TAIR-EQPM	M-TAIREQM-	Transfer air ductwork centerlines		7	0.18	5	1
M-TAIR-GRIL	M-TAIRGRM-	Transfer air equipment		0	0.35	200	13
<b>Diagram Information</b>		Sections		Sections			
M-DIAG-GRPH	M-DIAGGRM-	Graphics, gridlines, non-text items		M-SECT-IDEN	0	0.35	6
M-DIAG-INPD	M-DIAGINP-	Inch-pound specific dimensions and notes		M-SECT-MBND	0	0.25	1
M-DIAG-METR	M-DIAGMETM-	Metric specific dimensions and notes		M-SECT-MCUT	0	0.35	2
M-ELEV-FIXT	M-ELEVFM-	Miscellaneous fixtures		M-SECT-PAIT	0	0.18	8
M-ELEV-IDEN	M-ELEVIDM-	Component identification numbers		M-SECT-IPAM-	0	0.18	9
M-ELEV-OTLN	M-ELEVOTM-	Building outlines					
M-ELEV-PATT	M-ELEVPM-	Textures and hatch patterns					
<b>Detail Information</b>		Elevations		Elevations			
M-DETL-GRAPH	M-DETLGRM-	Graphics, gridlines, non-text items		M-ELEV-FIXT	0	0.35	6
M-DETL-INPD	M-DETLINP-	Inch-pound specific dimensions and notes		M-ELEV-IDEN	0	0.35	5
M-DETL-METR	M-DETLMETM-	Metric specific dimensions and notes		M-ELEV-OTLN	0	0.35	5
Note: V = Varies, NA = Not Applicable							

**Discipline: Electrical**  
Model File Layers/Levels

Level/Layer Naming		ISO Format	Level/Layer Description	Graphic Details		Model File Types	
<b>General Information</b>							
E-ANNO-DIMS	E-----DIP-	Witness/extension lines, dimension terminators, dimension text	0	V	V	V	V
E-ANNO-KEYN	E-----KEP-	Reference keynotes with associated leader	0	V	V	V	V
E-ANNO-MASK	E-----MAP-	Text/shape mask for use with photo backgrounds	0	0.18	113	16	X
E-ANNO-NOTE	E-----NDF-	General notes and general remarks	0	0.35	2	4	X
E-ANNO-NPLT	E-----NPP-	Non-printing graphic information	0	0.18	5	1	X
E-ANNO-PATT	E-----PAP-	Pattern, poche, shading, and hatching	V	0.18	8	9	X
E-ANNO-RDMF	E-----RDP-	Read-me information	0	0.18	5	1	X
E-ANNO-REFR	E-----RFP-	Reference files (AutoCAD users only)	NA	NA	NA	NA	X
E-ANNO-SYMB	E-----SYV-	Miscellaneous symbols	V	V	6	5	X
E-ANNO-TEXT	E-----TEP-	Miscellaneous text and callouts with associated leader	0	V	V	V	X
<b>Airfields</b>							
E-AFLD-BCN5-IDEN	E-AFLDBIM-	Identifier tags, symbol modifiers, and text	0	0	0.35	203	45
E-AFLD-BCN5-MISC	E-AFLDBMM-	Miscellaneous navairds - windcones and beacons	0	0.50	203	45	X
E-AFLD-BONS-STRB	E-AFLDBSM-	Strobe beacons	0	0.50	203	45	X
E-AFLD-CIRCC-CTRL	E-AFLDCCM-	Control and monitoring circuits	0	0.50	163	41	X
E-AFLD-CIRC-IDEN	E-AFLDCIM-	Circuit identifier tags, symbol modifier, and text	0	0	0.35	2	4
E-AFLD-CIRC-MULT	E-AFLDCMM-	Multiple circuits	0	0.50	23	46	X
E-AFLD-CIRC-SERS	E-AFLDCSM-	Series circuits	0	0.50	203	45	X
E-AFLD-DEVC	E-AFLDDEM-	Capacitors, voltage regulators, motors, buses, generators, meters, grounds, and m.	0	0.50	203	45	X
E-AFLD-DUCT	E-AFLDDUM-	Ductbanks	EUDUCN	0.50	83	42	X
E-AFLD-IBOX	E-AFLDIBM-	Junction boxes, pull boxes, manholes, handholes, pedestals, splice:	0	0.50	23	46	X
E-AFLD-LITE-APPR	E-AFLDLAM-	Approach lights	0	0	0.50	203	45
E-AFLD-LITE-DIST	E-AFLLDIM-	Distance and arresting gear markers	0	0	0.50	203	45
E-AFLD-LITE-LANE	E-AFLLLM-	Hoverlane, taxilane, and helipad lights	0	0	0.50	203	45
E-AFLD-LITE-OBST	E-AFLDLOM-	Obstruction lights	0	0	0.50	203	45
E-AFLD-LITE-RUNW	E-AFLDRUM-	Runway lights	0	0	0.50	203	45
E-AFLD-LITE-SIGN	E-AFLDSIM-	Taxiway guidance signs	0	0	0.50	203	45
E-AFLD-LITE-TAXI	E-AFLDTIM-	Taxiway lights	0	0	0.50	203	45
E-AFLD-LITE-THRS	E-AFLDHM-	Threshold lights	0	0	0.50	203	45
E-AFLD-VALT	E-AFLDVAM-	Airfield lighting vaults	0	0	0.50	203	45
<b>Alarm System</b>							
E-ALRM-EOPM	E-ALRMEQM-	Alarm system equipment	0	0	0.50	203	45
E-ALRM-IDEN	E-ALRIMIDM-	Identifier tags, symbol modifiers, and text	0	0	0.35	2	4
<b>Bell System</b>							
E-BELL-EOPM	E-BELLEQM-	Bell system equipment	0	0	0.50	203	45
E-BELL-IDEN	E-BELLIDM-	Identifier tags, symbol modifiers, and text	0	0	0.35	2	4
<b>Cable System</b>							
E-CABL-COAX	E-CABLCOM-	Coax cable	2	0.50	83	42	X
E-CABL-FIBR	E-CABLEFIR-	Fiber optics cable	FIBOPT	0.50	83	42	X
E-CABL-IDEN	E-CABLIDM-	Identifier tags, symbol modifiers, and text	0	0.35	2	4	X
E-CABL-MULT	E-CABLMULT-	Multi-conductor cable	V	0.50	83	42	X
E-CABL-TRAY	E-CABLTRM-	Cable trays and wireways	WIREWY	0.50	203	45	X
<b>Cathodic Protection System</b>							
E-CATH-ANOD	E-CATHANM-	Sacrificial anode system	0	0	0.50	83	42
E-CATH-CURR	E-CATHCUM-	Impress current system	0	0	0.50	83	42

**Discipline: Electrical**  
Model File Layers/Levels

Level/layer Naming		ISO Format		Level/Layer Description		Graphic Details		Model File Types	
E-CATH-IDEN	E-CATHIDM-	E-CATHIDM-	E-CATHIDM-	Identifier tags, symbol modifier, and tex		Line Style			Riser/One-Line Diagrams
E-CATH-TEST	E-CATHTEM-			Test stations		Line Width (mm)			
<b>Cable TV System</b>		E-CATV-EQPM	E-CATVEQM-	Cable TV system equipment		Line Width (mm)			
E-CATV-IDEN	E-CATVIDM-			Identifier tags, symbol modifiers, and tex		Line Width (mm)			
<b>Closed-Circuit Television System</b>		E-CCCTV-EOPM	E-CCCTVEQM-	Closed-circuit television system equipment		Line Width (mm)			
E-CCCTV-IDEN	E-CCCTVIDM-			Identifier tags, symbol modifiers, and tex		Line Width (mm)			
<b>Clock System</b>		E-CLOCK-EOPM	E-CLOKEQM-	Clock system equipment		Line Width (mm)			
E-CLOCK-IDEN	E-CLOKIDM-			Identifier tags, symbol modifiers, and tex		Line Width (mm)			
<b>Communications</b>		E-COMM-EOPM	E-COMMEQM-	Other communications distribution equipment		Line Width (mm)			
E-COMM-BOX	E-COMMBOM-			Communication junction boxes, pull boxes, manholes, pedestals, and s		Line Width (mm)			
E-COMM-OVHD	E-COMMOVM-			Overhead communications/telephone lines		Line Width (mm)			
E-COMM-OVHD-IDEN	E-COMMOVHD-			Identifier tags, symbol modifier and tex		Line Width (mm)			
E-COMM-POLE	E-COMMPDM-			Poles		Line Width (mm)			
E-COMM-POLE-GUYS	E-COMMPGMS-			Guying equipment		Line Width (mm)			
E-COMM-POLE-IDEN	E-COMMPDIDN-			Identifier tags, symbol modifiers, and tex		Line Width (mm)			
E-COMM-UNDR	E-COMMUNM-			Underground communications/telephone lines		Line Width (mm)			
E-COMM-UNDR-IDEN	E-COMMUM-			Identifier tags, symbol modifier and tex		Line Width (mm)			
<b>Central Dictation System</b>		E-DICT-EOPM	E-DICTEQM-	Central dictation system equipment		Line Width (mm)			
E-DICT-IDEN	E-DICTIDM-			Identifier tags, symbol modifiers, and tex		Line Width (mm)			
<b>Underground Ductbanks to be used when multiple systems are in one ductbank system</b>		E-DUCT-MULT	E-DUCTM-	Ductbank		Line Width (mm)			
E-DUCT-MULT-IDEN	E-DUCTIDM-			Identifier tags, symbol modifier and tex		Line Width (mm)			
<b>Energy Monitoring Control Systems</b>		E-EMCS-EOPM	E-EMCSEQM-	Energy monitoring control system equipment		Line Width (mm)			
E-EMCS-IDEN	E-EMCSIDM-			Identifier tags, symbol modifiers, and tex		Line Width (mm)			
<b>Floor Information</b>		E-FLOOR-IDEN	E-FLORIDM-	Room name, space identification text (copied from Architectural - Floor Plan model)	0	0.25	3	2	
E-FLOOR-NUMB	E-FLORNUM-			Room/space identification number and symbol (copied from Architectural - Floor Plan model file)	0	0.25	3	2	
<b>Ground System</b>		E-INTC-EOPM	E-INTCEQM-	Circuits	0	0.50	203	45	
E-INTC-IDEN	E-INTCIDM-			Identifier tags, symbol modifiers, and tex	0	0.35	2	4	
<b>Lighting</b>		E-LITE-CIRC	E-GRNDCLM-	Lighting circuits (including crosslines and homeruns)	0	0.50	4	7	
E-LITE-DIAG	E-GRNDDDM-			Ground system diagram	0	0.50	163	41	
E-LITE-EQUI	E-GRNDEQM-			Equipotential ground system	0	0.50	83	42	
E-GRND-REFR	E-GRNDREFR-			Reference ground system	0	0.50	23	46	
<b>Intercom System</b>		E-INTC-EOPM	E-INTCEQM-	Intercom system equipment	0	0.50	203	45	
E-INTC-IDEN	E-INTCIDM-			Identifier tags, symbol modifiers, and tex	0	0.35	2	4	
<b>Lighting</b>		E-LITE-CIRC	E-LITECJM-	Lighting circuit numbers (e.g., panel/circuit number, wire/conduit size)	0	0.50	83	42	
E-LITE-CIRCNUMB	E-LITECNM-			Ceiling mounted (surface/pendant) fixtures	0	0.50	203	45	

**Discipline: Electrical**  
Model File Layers/Levels

Level/layer Naming		ISO Format	Level/layer Description	Graphic Details		Model File Types
Level	Layer			Line Style	Line Width (mm)	
E-LITE-EMER	E-LITEEMM-	E-LITEEMM-	Emergency fixtures (outline of light (if ceiling mounted) should go on E-LITE-CLING	0	0.50	23
E-LITE-EXIT	E-LITEEXM-	E-LITEEXM-	Exit fixtures (outline of light (if ceiling mounted) should go on E-LITE-CLING	0	0.50	203
E-LITE-EXTR	E-LITEEXR-IDEN	E-LITEEXR-IDEN	Exterior lights	0	0.50	203
E-LITE-EXTR-IDEN	E-LITEEXR-IDEN	E-LITEEXR-IDEN	Exterior light identifier tags, symbol modifiers, and tex	0	0.35	203
E-LITE-FLOR	E-LITEFLM-	E-LITEFLM-	Floor mounted fixtures (e.g., stage)	0	0.50	203
E-LITE-IDEN	E-LITEIDM-	E-LITEIDM-	Light fixture identifier tags	0	0.35	2
E-LITE-JBOX	E-LITEJBOX-	E-LITEJBOX-	Junction boxes	0	0.50	83
E-LITE-PANL	E-LITEPANL-	E-LITEPANL-	Main distribution panels, switchboards, lighting panels	0	0.50	42
E-LITE-ROOF	E-LITEROM-	E-LITEROM-	Roof lighting	0	0.50	203
E-LITE-SPCL	E-LITESPM-	E-LITESPM-	Special fixtures	0	0.50	203
E-LITESWCH	E-LITESWCH-	E-LITESWCH-	Lighting contactors, photoelectric controls, low-voltage lighting controls, etc	0	0.50	163
E-LITE-WALL	E-LITEWAM-	E-LITEWAM-	Wall mounted fixtures	0	0.50	203
<b>Lightning Protection System</b>						
E-LTING-COND	E-LTINGCOM-	E-LTINGCOM-	Lightning protection conductors	0	0.50	203
E-LTING-TERM	E-LTINGTEM-	E-LTINGTEM-	Lightning protection terminals	0	0.35	2
<b>Nurse Call/Paging System</b>						
E-NURS-EOPM	E-NURSEOM-	E-NURSEOM-	Nurse call/paging system equipment	0	0.50	203
E-NURS-IDEN	E-NURSIDM-	E-NURSIDM-	Identifier tags, symbol modifiers, and tex	0	0.35	2
<b>Power</b>						
E-POWRS-BUSW	E-POWERBLM-	E-POWERBLM-	Busways	0	0.50	203
E-POWRC-CIRC	E-POWRCM-	E-POWRCM-	Power circuits (including crosslines and humeruns)	V	0.50	83
E-POWRC-CIRCU-NUMB	E-POWRCNM-	E-POWRCNM-	Power circuit numbers (e.g., panel/circuit number, wire/conduit size)	0	0.35	2
E-POWRC-CLING	E-POWRCLM-	E-POWRCLM-	Ceiling outlets (receptacles and switches)	0	0.50	83
E-POWRC-DEVIC	E-POWRDEM-	E-POWRDEM-	Capacitors, voltage regulators, motors, buses, generators, meters, grounds, and m	0	0.50	23
E-POWRF-FEED	E-POWRFEM-	E-POWRFEM-	Feeders	0	0.50	203
E-POWRF-GENR	E-POWRIBM-	E-POWRIBM-	Generators and auxiliary equipment	0	0.50	4
E-POWRF-JBOX	E-POWRFJBOX-	E-POWRFJBOX-	Junction boxes, pull boxes, manholes, handholes, pedestals, splice:	0	0.50	83
E-POWRF-MOTR	E-POWRMOM-	E-POWRMOM-	Motors and utilization equipment	0	0.50	4
E-POWRF-PANL	E-POWRPAM-	E-POWRPAM-	Panelboards, switchboards, MCC, unit substations, backing boards, patch panel ra	0	0.50	7
E-POWRF-POLE	E-POWRPCM-	E-POWRPCM-	Power poles	0	0.50	203
E-POWRF-POLE-GUYS	E-POWRPCM-	E-POWRPCM-	Guying equipment	0	0.50	203
E-POWRF-POLE-IDEN	E-POWRPAM-	E-POWRPAM-	Identifier tags, symbol modifiers, and tex	0	0.35	203
E-POWRF-SUBS	E-POWRSUM-	E-POWRSUM-	Other substation equipment	0	0.50	23
E-POWRSWCH	E-POWRSWM-	E-POWRSWM-	Fuse cutouts, motor starters, contactors, pole mounted switches, circuit breakers, gang operated disconnects, reclosers, cubicle switches	0	0.50	163
E-POWUR-URAC	E-POWRURM-	E-POWRURM-	Underfloor raceways	3	0.50	203
E-POWUR-WALL	E-POWRWAM-	E-POWRWAM-	Wall/floor outlets (receptacles and switches)	0	0.50	83
E-POWUR-XFMR-PADM	E-POWRXFPM-	E-POWRXFPM-	Pad mounted transformers	0	0.50	23
E-POWUR-XFMR-POLM	E-POWRXPM-	E-POWRXPM-	Pole mounted transformers	0	0.50	23
<b>Primary Electrical Cables</b>						
E-PRIM-OVHD	E-PRIMOMV-	E-PRIMOMV-	Overhead electrical utility lines	EPARN	0.50	7
E-PRIM-OVHD-IDEN	E-PRIMOIDM-	E-PRIMOIDM-	Identifier tags, symbol modifiers, and tex	0	0.35	4
E-PRIM-UNDR	E-PRIMUNM-	E-PRIMUNM-	Underground electrical utility lines	EPUGN	0.50	7
E-PRIM-UNDR-IDEN	E-PRIMUDM-	E-PRIMUDM-	Identifier tags, symbol modifiers, and tex	0	0.35	4
<b>Secondary Electrical Cables</b>						
E-SECDD-OVHD	E-SECDDOMV-	E-SECDDOMV-	Overhead electrical utility lines	ESARN	0.50	41

**Discipline: Electrical**  
Model File Layers/Levels

Level/layer Naming		ISO Format	Level/layer Description	Graphic Details		Model File Types
Level	Layer			Line Style	Line Width (mm)	
E-SECD-OVHD-IDEN	E-SECDOM-IDEN	E-SERTACCS	Access control system	0	0.35	163 41
E-SECD-UNDR	E-SECDUNM-IDEN	E-SERTCLING	Ceiling mounted sensors	0	0.50	163 41
E-SECD-UNDR-IDEN	E-SECDUNM-IDEN	E-SERTFLM-IDEN	Floor mounted sensors	0	0.50	163 41
<b>Security System</b>		E-SERTIDEN	Identifier tags, symbol modifiers, and text	0	0.35	163 41
		E-SERTUNR-IDEN	E-SERTUNM-IDEN	0	0.35	163 41
		E-SERT-WALL	E-SERTWAM-IDEN	0	0.50	23 46
<b>Sound/PA System</b>		E-SOUN-EOPM	E-SOUNEOM-IDEN	0	0.50	203 45
		E-SOUN-IDEN	E-SOUNNDM-IDEN	0	0.35	2 4
<b>Special Systems</b>		E-SPCL-SYST	E-SPCLSPSM-IDEN	0	0.50	203 45
		E-SPCL-SYST-IDEN	E-SPCLSM-IDEN	0	0.35	203 45
		E-SPCL-TRAF	E-SPCLTRM-IDEN	0	0.50	203 45
		E-SPCL-TRAF-IDEN	E-SPCLTLM-IDEN	0	0.35	203 45
<b>TV Antenna System</b>		E-TVAN-EOPM	E-TVANEQDM-IDEN	0	0.50	203 45
		E-TVAN-IDEN	E-TVANIDM-IDEN	0	0.35	2 4
<b>Other Discipline Information</b>		E-DISC-INFO	E-DISCRNM-IDEN	0	0.25	3 2
<b>Detail Information</b>		E-DETL-GRPH	E-DETLGMR-IDEN	V	V	V
		E-DETL-INPD	E-DETLINNM-IDEN	0	0.35	2 4
		E-DETL-METR	E-DETMEM-IDEN	0	0.35	2 4
<b>Diagram Information</b>		E-DIAG-GRPH	E-DIAGGMR-IDEN	V	V	V
		E-DIAG-IDEN	E-DIAGIDM-IDEN	0	0.35	2 4
		E-DIAG-INPD	E-DIAGINNM-IDEN	0	0.35	2 4
		E-DIAG-METR	E-DIAGMEM-IDEN	0	0.35	2 4

Note: V = Varies, NA = Not Applicable

**Discipline: Telecommunications**  
Model File Layers/Levels

Level/layer Naming		ISO Format	Level/layer Description	Graphic Details		Model File Types
AIA Format	ISO Format			Line Style	Line Width (mm)	MicroStation Color #
<b>General Information</b>						
T-TANNO-DIMS	T----DIP-	Witness/extension lines, dimension terminators, dimension text	0	V	V	V
T-TANNO-KEYN	T----KEP-	Reference keynotes with associated leader	0	V	V	V
T-TANNO-NOTE	T----NOP-	General notes and general remarks	0	0.35	2	4
T-TANNO-NPLT	T----NPF-	Non-printing graphic information	0	0.18	5	1
T-TANNO-PATT	T----PAP-	Patterned, poche, shading, and hatching	0	0.18	8	9
T-TANNO-RDME	T----RDP-	Red-me information	0	0.18	5	1
T-TANNO-REFR	T----REFP-	Reference files (AutoCAD users only)	NA	NA	NA	NA
T-TANNO-SYMB	T----SYP-	Miscellaneous symbols	V	V	6	5
T-TANNO-TEXT	T----TEP-	Miscellaneous text and callouts with associated leader	0	V	V	V
<b>Cable System</b>						
T-CABL-COAX	T-CABL-COM-	Coax cable	2	0.50	83	42
T-CABL-FIBR	T-CABL-FIM-	Fiber optics cable	FIBOPT	0.50	83	42
T-CABL-IDEN	T-CABLIDM-	Cable identifiers	0	0.35	2	4
T-CABL-MULT	T-CABLUM-	Multi-conductor cable	0	0.50	83	42
T-CABL-TRAY	T-CABLTRM-	Cable trays and wireways	0	0.50	203	45
<b>Equipment</b>						
T-EQPM-COMB	T-EQPMCM-	Distribution equipment for both copper and fiber optics	0	0.50	4	7
T-EQPM-COPP	T-EQPMCOM-	Distribution equipment for copper	0	0.50	4	7
T-EQPM-FIBR	T-EQPMFM-	Distribution equipment for fiber optic	0	0.50	4	7
T-EQPM-OTHR	T-EQPMOTM-	Other telecommunications equipment	0	0.50	4	7
T-EQPM-RELA	T-EQPMREM-	Relays, resistors, capacitors, and inductors	0	0.50	4	7
<b>Floor Information</b>						
T-FLOR-IDEN	T-FLORDIM-	Room name, space identification text (copied from Architectural - Floor Plan model file)	0	0.25	3	2
T-FLOR-NUMB	T-FLORNUM-	Room/space identification number and symbol (copied from Architectural - Floor Plan model file)	0	0.25	3	2
<b>Jacks</b>						
T-JACK-COMB	T-JACKCOM-	Combination telephone and data/LAN jacks	0	0.50	203	45
T-JACK-DATA	T-JACKDA-	Data/LAN jacks	0	0.50	203	45
T-JACK-IDEN	T-JACKIDM-	Identifier tags, symbol modifiers, and text	0	0.35	2	4
T-JACK-PHON	T-JACKPHM-	Telephone jacks	0	0.50	203	45
<b>Junction Boxes</b>						
T-COMM-JBOX	T-COMMBJM-	Junction boxes	0	0.50	83	42
<b>Other Discipline Information</b>						
T-DISC-INFO	T-DISCIINI-	Information and notes for other disciplines	V	V	V	V
<b>Diagram Information</b>						
T-DIAG-GRPH	T-DIAGGRM-	Graphics, gridlines, non-text items	V	V	V	V
T-DIAG-IDEN	T-DIAGIDM-	Identifier tags, symbol modifiers, and text	0	0.35	2	4
T-DIAG-INPD	T-DIAGINNM-	Inch-pound specific dimensions and notes	0	0.35	2	4
T-DIAG-METR	T-DIAGMETM-	Metric specific dimensions and notes	0	0.35	2	4
<b>Detail Information</b>						
T-DETL-GRPH	T-DETLGRM-	Graphics, gridlines, non-text items	V	V	V	V
T-DETL-INPD	T-DETLINNM-	Inch-pound specific dimensions and notes	V	V	V	V
T-DETL-METR	T-DETMETM-	Metric specific dimensions and notes	V	V	V	V

Note: V = Varies, NA = Not Applicable

# **Appendix B**

## **Sheet File Level/Layer Assignment Tables**

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This appendix provides the sheet file level/layer assignment tables:

General.....	B3
Hazardous Materials .....	B4
Survey/Mapping.....	B5
Geotechnical .....	B6
Civil .....	B7
Landscape .....	B8
Structural.....	B9
Architectural .....	B10
Interiors .....	B11
Fire Protection.....	B12
Plumbing .....	B13
Mechanical.....	B14
Electrical .....	B15
Telecommunications .....	B16



## Discipline: General

Level/Layer Naming		Level/Layer Description		Graphic Defaults			
AIA Format	ISO Format	Line Style	Line Width (mm)	AutoCAD Color #	MicroStation Color #	0	V
G-ANNO-DIMS	G-----DIP-	Sheet-specific dimensions (includes witness/extension lines, dimension terminators, dimension text)				0	V
G-ANNO-KEYN	G-----KEP-	Sheet-specific reference keynotes with associated leaders				0	V
G-ANNO-LEGN	G-----LEP-	Legends and symbol keys				0	V
G-ANNO-NOTE	G-----NOP-	Sheet-specific notes and general remarks				0	V
G-ANNO-NPLT	G-----NPP-	Non-plotting graphic information				0	0.35
G-ANNO-PATT	G-----PAP-	Sheet-specific patterning and hatching (e.g., keyplan patterning)				0	2
G-ANNO-RDME	G-----RDP-	Read-me information (not plotted)				0	4
G-ANNO-REDL	G-----REP-	Redlines				0	1
G-ANNO-REFR	G-----RFP-	Reference files (AutoCAD users only)				NA	NA
G-ANNO-REVS	G-----RVP-	Revisions				0	NA
G-ANNO-SCHD	G-----SCP-	Schedules				0	NA
G-ANNO-SYMB	G-----SYP-	Sheet-specific symbols (e.g., scales, north arrow, section cuts, detail bubbles, etc.)				V	NA
G-ANNO-TEXT	G-----TEP-	Sheet-specific text and callouts with associated leaders (e.g., title block text, legend and schedule text)				0	V

Note: V = Varies, NA = Not Applicable

## Discipline: Hazardous Materials

Level/Layer Naming		AIA Format		ISO Format		Level/Layer Description		Graphic Defaults	
								MicroStation Color #	AutoCAD Color #
						Line Style	Line Width (mm)		
General Information								0	V
H-ANNO-DIMS	H-----DIP-								V
H-ANNO-KEYN	H-----KEP-								V
H-ANNO-LEGN	H-----LEP-								V
H-ANNO-NOTE	H-----NOP-								V
H-ANNO-NPLT	H-----NPP-							0	0.35
H-ANNO-PATT	H-----PAP-							0	2
H-ANNO-RDME	H-----RDP-							0	4
H-ANNO-REDL	H-----REP-							0	1
H-ANNO-REFR	H-----RFP-							0	5
H-ANNO-REV/S	H-----RVP-							0	1
H-ANNO-SCHD	H-----SCP-							0	3
H-ANNO-SYMB	H-----SYP-							0	NA
H-ANNO-TEXT	H-----TEP-							0	NA

Note: V = Varies, NA = Not Applicable

## Discipline: Survey/Mapping

Level/Layer Naming		Level/Layer Description		Graphic Defaults			
AIA Format	ISO Format	Line Style	Line Width (mm)	AutoCAD Color #	MicroStation Color #	V	V
V-ANNO-DIMS	V-----DIP-	Sheet-specific dimensions (includes witness/extension lines, dimension terminators, dimension text)	0	V	V	V	V
V-ANNO-KEYN	V-----KEP-	Sheet-specific reference keynotes with associated leaders	0	V	V	V	V
V-ANNO-LEGN	V-----LEP-	Legends and symbol keys	0	V	V	V	V
V-ANNO-NOTE	V-----NOP-	Sheet-specific notes and general remarks	0	0.35	2	4	
V-ANNO-NPLT	V-----NPP-	Non-plotting graphic information	0	0.18	5	1	
V-ANNO-PATT	V-----PAP-	Sheet-specific patterning and hatching (e.g., keyplan patterning)	0	0.18	8	9	
V-ANNO-RDME	V-----RDP-	Read-me information (not plotted)	0	0.18	5	1	
V-ANNO-REDL	V-----REP-	Redlines	0	0.25	1	3	
V-ANNO-REFR	V-----RFP-	Reference files (AutoCAD users only)	NA	NA	NA	NA	
V-ANNO-REV/S	V-----RVP-	Revisions	0	0.50	4	7	
V-ANNO-SCHD	V-----SCP-	Schedules	0	V	V	V	
V-ANNO-SYMB	V-----SYP-	Sheet-specific symbols (e.g., scales, north arrow, section cuts, detail bubbles, etc.)	V	0.35	6	5	
V-ANNO-TEXT	V-----TEP-	Sheet-specific text and callouts with associated leaders (e.g., title block text, legend and schedule text)	0	V	V	V	

Note: V = Varies, NA = Not Applicable

## Discipline: Geotechnical

Level/Layer Naming		Level/Layer Description		Graphic Defaults			
AIA Format	ISO Format	Line Style	Line Width (mm)	AutoCAD Color #	MicroStation Color #	V	V
B-ANNO-DIMS	B-----DIP-	Sheet-specific dimensions (includes witness/extension lines, dimension terminators, dimension text)	0	V	V	V	V
B-ANNO-KEYN	B-----KEP-	Sheet-specific reference keynotes with associated leaders	0	V	V	V	V
B-ANNO-LEGN	B-----LEP-	Legends and symbol keys	0	V	V	V	V
B-ANNO-NOTE	B-----NOP-	Sheet-specific notes and general remarks	0	0.35	2	4	
B-ANNO-NPLT	B-----NPP-	Non-plotting graphic information	0	0.18	5	1	
B-ANNO-PATT	B-----PAP-	Sheet-specific patterning and hatching (e.g., keyplan patterning)	0	0.18	8	9	
B-ANNO-RDME	B-----RDP-	Read-me information (not plotted)	0	0.18	5	1	
B-ANNO-REDL	B-----REP-	Redlines	0	0.25	1	3	
B-ANNO-REFR	B-----RFP-	Reference files (AutoCAD users only)	NA	NA	NA	NA	
B-ANNO-REV/S	B-----RVP-	Revisions	0	0.50	4	7	
B-ANNO-SCHD	B-----SCP-	Schedules	0	V	V	V	
B-ANNO-SYMB	B-----SYP-	Sheet-specific symbols (e.g., scales, north arrow, section cuts, detail bubbles, etc.)	V	0.35	6	5	
B-ANNO-TEXT	B-----TEP-	Sheet-specific text and callouts with associated leaders (e.g., title block text, legend and schedule text)	0	V	V	V	

Note: V = Varies, NA = Not Applicable

**Discipline: Civil**

Level/Layer Naming		AIA Format		ISO Format		Level/Layer Description		Graphic Defaults	
								MicroStation Color #	AutoCAD Color #
						Line Style	Line Width (mm)	V	V
General Information								0	V
C-ANNO-DIMS	C-----DIP-					Sheet-specific dimensions (includes witness/extension lines, dimension terminators, dimension text)		0	V
C-ANNO-KEYN	C-----KEP-					Sheet-specific reference keynotes with associated leaders		0	V
C-ANNO-LEGN	C-----LEP-					Legends and symbol keys		0	V
C-ANNO-NOTE	C-----NOP-					Sheet-specific notes and general remarks		0	V
C-ANNO-NPLT	C-----NPP-					Non-plotting graphic information		0	0.35
C-ANNO-PATT	C-----PAP-					Sheet-specific patterning and hatching (e.g., keyplan patterning)		0	2
C-ANNO-RDME	C-----RDP-					Read-me information (not plotted)		0	4
C-ANNO-REDL	C-----REP-					Redlines		0	1
C-ANNO-REFR	C-----RFP-					Reference files (AutoCAD users only)		0	3
C-ANNO-REV/S	C-----RVP-					Revisions		0	5
C-ANNO-SCHD	C-----SCP-					Schedules		0	7
C-ANNO-SYMB	C-----SYP-					Sheet-specific symbols (e.g., scales, north arrow, section cuts, detail bubbles, etc.)		0	6
C-ANNO-TEXT	C-----TEP-					Sheet-specific text and callouts with associated leaders (e.g., title block text, legend and schedule text)		0	5

Note: V = Varies, NA = Not Applicable

## Discipline: Landscape

Level/Layer Naming		AIA Format		ISO Format		Level/Layer Description		Graphic Defaults			
								MicroStation Color #	AutoCAD Color #	Line Width (mm)	Line Style
L-ANNO-DIMS	L-----DIP-					Sheet-specific dimensions (includes witness/extension lines, dimension terminators, dimension text)		0	V	V	V
L-ANNO-KEYN	L-----KEP-					Sheet-specific reference keynotes with associated leaders		0	V	V	V
L-ANNO-LEGN	L-----LEP-					Legends and symbol keys		0	V	V	V
L-ANNO-NOTE	L-----NOP-					Sheet-specific notes and general remarks		0	0.35	2	4
L-ANNO-NPLT	L-----NPP-					Non-plotting graphic information		0	0.18	5	1
L-ANNO-PATT	L-----PAP-					Sheet-specific patterning and hatching (e.g., keyplan patterning)		0	0.18	8	9
L-ANNO-RDME	L-----RDP-					Read-me information (not plotted)		0	0.18	5	1
L-ANNO-REDL	L-----REP-					Redlines		0	0.25	1	3
L-ANNO-REFR	L-----RFP-					Reference files (AutoCAD users only)		NA	NA	NA	NA
L-ANNO-REVS	L-----RVP-					Revisions		0	0.50	4	7
L-ANNO-SCHD	L-----SCP-					Schedules		0	V	V	V
L-ANNO-SYMB	L-----SYP-					Sheet-specific symbols (e.g., scales, north arrow, section cuts, detail bubbles, etc.)		V	0.35	6	5
L-ANNO-TEXT	L-----TEP-					Sheet-specific text and callouts with associated leaders (e.g., title block text, legend and schedule text)		0	V	V	V

Note: V = Varies, NA = Not Applicable

## Discipline: Structural

Level/Layer Naming		AIA Format		ISO Format		Level/Layer Description		Graphic Defaults			
								MicroStation Color #	AutoCAD Color #	Line Width (mm)	Line Style
S-ANNO-DIMS	S-----DIP-					Sheet-specific dimensions (includes witness/extension lines, dimension terminators, dimension text)		0	V	V	V
S-ANNO-KEYN	S-----KEP-					Sheet-specific reference keynotes with associated leaders		0	V	V	V
S-ANNO-LEGN	S-----LEP-					Legends and symbol keys		0	V	V	V
S-ANNO-NOTE	S-----NOP-					Sheet-specific notes and general remarks		0	0.35	2	4
S-ANNO-NPLT	S-----NPP-					Non-plotting graphic information		0	0.18	5	1
S-ANNO-PATT	S-----PAP-					Sheet-specific patterning and hatching (e.g., keyplan patterning)		0	0.18	8	9
S-ANNO-RDME	S-----RDP-					Read-me information (not plotted)		0	0.18	5	1
S-ANNO-REDL	S-----REP-					Redlines		0	0.25	1	3
S-ANNO-REFR	S-----RFP-					Reference files (AutoCAD users only)		NA	NA	NA	NA
S-ANNO-REV/S	S-----RVP-					Revisions		0	0.50	4	7
S-ANNO-SCHD	S-----SCP-					Schedules		0	V	V	V
S-ANNO-SYMB	S-----SYP-					Sheet-specific symbols (e.g., scales, north arrow, section cuts, detail bubbles, etc.)		V	0.35	6	5
S-ANNO-TEXT	S-----TEP-					Sheet-specific text and callouts with associated leaders (e.g., title block text, legend and schedule text)		0	V	V	V

Note: V = Varies, NA = Not Applicable

## Discipline: Architectural

Level/Layer Naming		AIA Format		ISO Format		Level/Layer Description		Graphic Defaults	
								MicroStation Color #	AutoCAD Color #
						Line Style	Line Width (mm)		
								0	V
A-ANNO-DIMS	A-----DIP-					Sheet-specific dimensions (includes witness/extension lines, dimension terminators, dimension text)		0	V
A-ANNO-KEYN	A-----KEP-					Sheet-specific reference keynotes with associated leaders		0	V
A-ANNO-LEGN	A-----LEP-					Legends and symbol keys		0	V
A-ANNO-NOTE	A-----NOP-					Sheet-specific notes and general remarks		0	V
A-ANNO-NPLT	A-----NPP-					Non-plotting graphic information		0	0.35
A-ANNO-PATT	A-----PAP-					Sheet-specific patterning and hatching (e.g., keyplan patterning)		0	2
A-ANNO-RDME	A-----RDP-					Read-me information (not plotted)		0	4
A-ANNO-REDL	A-----REP-					Redlines		0	0.18
A-ANNO-REFR	A-----RFP-					Reference files (AutoCAD users only)		NA	5
A-ANNO-REV/S	A-----RVP-					Revisions		0	1
A-ANNO-SCHD	A-----SCP-					Schedules		0	NA
A-ANNO-SYMB	A-----SYP-					Sheet-specific symbols (e.g., scales, north arrow, section cuts, detail bubbles, etc.)		0	NA
A-ANNO-TEXT	A-----TEP-					Sheet-specific text and callouts with associated leaders (e.g., title block text, legend and schedule text)		0	NA

Note: V = Varies, NA = Not Applicable

## Discipline: Interiors

AIA Format	ISO Format	Level/Layer Description	Graphic Defaults					
			Line Style	Line Width (mm)	AutoCAD Color #	MicroStation Color #	0	V
I-ANNO-DIMS	I-----DIP-	Sheet-specific dimensions (includes witness/extension lines, dimension terminators, dimension text)					0	V
I-ANNO-KEYN	I-----KEP-	Sheet-specific reference keynotes with associated leaders					0	V
I-ANNO-LEGN	I-----LEP-	Legends and symbol keys					0	V
I-ANNO-NOTE	I-----NOP-	Sheet-specific notes and general remarks					0	V
I-ANNO-NPLT	I-----NPP-	Non-plotting graphic information					0	0.35
I-ANNO-PATT	I-----PAP-	Sheet-specific patterning and hatching (e.g., keyplan patterning)					0	2
I-ANNO-RDMIE	I-----RDP-	Read-me information (not plotted)					0	4
I-ANNO-REDL	I-----REP-	Redlines					0	1
I-ANNO-REFR	I-----RFP-	Reference files (AutoCAD users only)					NA	3
I-ANNO-REVS	I-----RVP-	Revisions					0	NA
I-ANNO-SCHD	I-----SCP-	Schedules					0	NA
I-ANNO-SYMB	I-----SYP-	Sheet-specific symbols (e.g., scales, north arrow, section cuts, detail bubbles, etc.)					V	NA
I-ANNO-TEXT	I-----TEP-	Sheet-specific text and callouts with associated leaders (e.g., title block text, legend and schedule text)					0	NA

Note: V = Varies, NA = Not Applicable

## Discipline: Fire Protection

Level/Layer Naming		AIA Format		ISO Format		Level/Layer Description		Graphic Defaults			
								Line Style	Line Width (mm)	AutoCAD Color #	MicroStation Color #
F-ANNO-DIMS	F-----DIP-					Sheet-specific dimensions (includes witness/extension lines, dimension terminators, dimension text)		0	V	V	V
F-ANNO-KEYN	F-----KEP-					Sheet-specific reference keynotes with associated leaders		0	V	V	V
F-ANNO-LEGN	F-----LEP-					Legends and symbol keys		0	V	V	V
F-ANNO-NOTE	F-----NOP-					Sheet-specific notes and general remarks		0	0.35	2	4
F-ANNO-NPLT	F-----NPP-					Non-plotting graphic information		0	0.18	5	1
F-ANNO-PATT	F-----PAP-					Sheet-specific patterning and hatching (e.g., keyplan patterning)		0	0.18	8	9
F-ANNO-RDME	F-----RDP-					Read-me information (not plotted)		0	0.18	5	1
F-ANNO-REDL	F-----REP-					Redlines		0	0.25	1	3
F-ANNO-REFR	F-----RFP-					Reference files (AutoCAD users only)		NA	NA	NA	NA
F-ANNO-REV/S	F-----RVP-					Revisions		0	0.50	4	7
F-ANNO-SCHD	F-----SCP-					Schedules		0	V	V	V
F-ANNO-SYMB	F-----SYP-					Sheet-specific symbols (e.g., scales, north arrow, section cuts, detail bubbles, etc.)		V	0.35	6	5
F-ANNO-TEXT	F-----TEP-					Sheet-specific text and callouts with associated leaders (e.g., title block text, legend and schedule text)		0	V	V	V

Note: V = Varies, NA = Not Applicable

## Discipline: Plumbing

Level/Layer Naming		AIA Format		ISO Format		Level/Layer Description		Graphic Defaults	
								MicroStation Color #	AutoCAD Color #
						Line Style	Line Width (mm)		
P-ANNO-DIMS	P-----DIP-					Sheet-specific dimensions (includes witness/extension lines, dimension terminators, dimension text)		0	V
P-ANNO-KEYN	P-----KEP-					Sheet-specific reference keynotes with associated leaders		0	V
P-ANNO-LEGN	P-----LEP-					Legends and symbol keys		0	V
P-ANNO-NOTE	P-----NOP-					Sheet-specific notes and general remarks		0	V
P-ANNO-NPLT	P-----NPP-					Non-plotting graphic information		0	0.35
P-ANNO-PATT	P-----PAP-					Sheet-specific patterning and hatching (e.g., keyplan patterning)		0	2
P-ANNO-RDME	P-----RDP-					Read-me information (not plotted)		0	4
P-ANNO-REDL	P-----REP-					Redlines		0	0.18
P-ANNO-REFR	P-----RFP-					Reference files (AutoCAD users only)		NA	NA
P-ANNO-REV/S	P-----RVP-					Revisions		0	NA
P-ANNO-SCHD	P-----SCP-					Schedules		0	NA
P-ANNO-SYMB	P-----SYP-					Sheet-specific symbols (e.g., scales, north arrow, section cuts, detail bubbles, etc.)		0	NA
P-ANNO-TEXT	P-----TEP-					Sheet-specific text and callouts with associated leaders (e.g., title block text, legend and schedule text)		0	NA

Note: V = Varies, NA = Not Applicable

## Discipline: Mechanical

Level/Layer Naming		AIA Format		ISO Format		Level/Layer Description		Graphic Defaults	
								MicroStation Color #	AutoCAD Color #
						Line Style	Line Width (mm)		
								0	V
M-ANNO-DIMS	M-----DIP-							0	V
M-ANNO-KEYN	M-----KEP-							0	V
M-ANNO-LEGN	M-----LEP-							0	V
M-ANNO-NOTE	M-----NOP-							0	V
M-ANNO-NPLT	M-----NPP-							0	0.35
M-ANNO-PATT	M-----PAP-							0	2
M-ANNO-RDME	M-----RDP-							0	4
M-ANNO-REDL	M-----REP-							0	1
M-ANNO-REFR	M-----RFP-							0	3
M-ANNO-REVS	M-----RVP-							0	5
M-ANNO-SCHD	M-----SCP-							0	1
M-ANNO-SYMB	M-----SYP-							0	NA
M-ANNO-TEXT	M-----TEP-							0	NA

Note: V = Varies, NA = Not Applicable

## Discipline: Electrical

Level/Layer Naming		AIA Format		ISO Format		Level/Layer Description		Graphic Defaults	
								MicroStation Color #	AutoCAD Color #
						Line Style	Line Width (mm)		
E-ANNO-DIMS	E-----DIP-					Sheet-specific dimensions (includes witness/extension lines, dimension terminators, dimension text)		0	V
E-ANNO-KEYN	E-----KEP-					Sheet-specific reference keynotes with associated leaders		0	V
E-ANNO-LEGN	E-----LEP-					Legends and symbol keys		0	V
E-ANNO-NOTE	E-----NOP-					Sheet-specific notes and general remarks		0	V
E-ANNO-NPLT	E-----NPP-					Non-plotting graphic information		0	0.35
E-ANNO-PATT	E-----PAP-					Sheet-specific patterning and hatching (e.g., keyplan patterning)		0	2
E-ANNO-RDME	E-----RDP-					Read-me information (not plotted)		0	4
E-ANNO-REDL	E-----REP-					Redlines		0	1
E-ANNO-REFR	E-----RFP-					Reference files (AutoCAD users only)		NA	NA
E-ANNO-REV/S	E-----RVP-					Revisions		0	NA
E-ANNO-SCHD	E-----SCP-					Schedules		0	NA
E-ANNO-SYMB	E-----SYP-					Sheet-specific symbols (e.g., scales, north arrow, section cuts, detail bubbles, etc.)		V	NA
E-ANNO-TEXT	E-----TEP-					Sheet-specific text and callouts with associated leaders (e.g., title block text, legend and schedule text)		0	V

Note: V = Varies, NA = Not Applicable

## Discipline: Telecommunications

Level/Layer Naming		AIA Format		ISO Format		Level/Layer Description		Graphic Defaults			
								MicroStation Color #	AutoCAD Color #	Line Width (mm)	Line Style
T-ANNO-DIMS	T-----DIP-					Sheet-specific dimensions (includes witness/extension lines, dimension terminators, dimension text)		0	V	V	V
T-ANNO-KEYN	T-----KEP-					Sheet-specific reference keynotes with associated leaders		0	V	V	V
T-ANNO-LEGN	T-----LEP-					Legends and symbol keys		0	V	V	V
T-ANNO-NOTE	T-----NOP-					Sheet-specific notes and general remarks		0	0.35	2	4
T-ANNO-NPLT	T-----NPP-					Non-plotting graphic information		0	0.18	5	1
T-ANNO-PATT	T-----PAP-					Sheet-specific patterning and hatching (e.g., keyplan patterning)		0	0.18	8	9
T-ANNO-RDME	T-----RDP-					Read-me information (not plotted)		0	0.18	5	1
T-ANNO-REDL	T-----REP-					Redlines		0	0.25	1	3
T-ANNO-REFR	T-----RFP-					Reference files (AutoCAD users only)		NA	NA	NA	NA
T-ANNO-REVS	T-----RVP-					Revisions		0	0.50	4	7
T-ANNO-SCHD	T-----SCP-					Schedules		0	V	V	V
T-ANNO-SYMB	T-----SYP-					Sheet-specific symbols (e.g., scales, north arrow, section cuts, detail bubbles, etc.)		V	0.35	6	5
T-ANNO-TEXT	T-----TEP-					Sheet-specific text and callouts with associated leaders (e.g., title block text, legend and schedule text)		0	V	V	V

Note: V = Varies, NA = Not Applicable

# **Appendix C**

## **Color Comparison**

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For more information on Screened Colors, see the section "Screening" in Chapter 3 "Graphic Concepts."



Appendix C Color Comparison		
AutoCAD Color No.	MicroStation Color No.	Screened Color
1	3	
2	4	
3	2	
4	7	
5	1	
6	5	
7	0	
8	9	
9	14	
10	10	
11	19	
12	27	
13	35	
14	43	
15	51	
16	59	
17	67	
18	75	
19	83	
20	6	
21	30	
22	22	
23	46	
24	38	
25	62	
26	54	
27	78	
28	70	
29	94	
30	86	
31	110	
32	102	
33	126	
34	118	
35	142	
36	134	
37	158	
38	150	
39	174	
40	166	
41	190	
42	182	
43	206	
44	198	
45	222	
46	214	

Appendix C Color Comparison		
AutoCAD Color No.	MicroStation Color No.	Screened Color
47	238	
48	230	
49	251	
50	20	
51	28	
52	36	
53	44	
54	52	
55	60	
56	68	
57	76	
58	84	
59	92	
60	100	
61	108	
62	116	
63	124	
64	132	
65	140	
66	148	
67	156	
68	164	
69	172	
70	180	
71	188	
72	196	
73	204	
74	212	
75	220	
76	228	
77	236	
78	244	
79	252	
80	11	
81	26	
82	18	
83	42	
84	34	
85	58	
86	50	
87	74	
88	66	
89	90	
90	82	
91	106	
92	98	

Appendix C Color Comparison		
AutoCAD Color No.	MicroStation Color No.	Screened Color
93	122	
94	114	
95	138	
96	130	
97	154	
98	146	
99	170	
100	162	
101	186	
102	178	
103	202	
104	194	
105	218	
106	210	
107	234	
108	226	
109	250	
110	242	
111	246	
112	247	
113	16	
114	32	
115	48	
116	64	
117	80	
118	96	
119	112	
120	12	
121	15	
122	23	
123	31	
124	39	
125	47	
126	55	
127	63	
128	71	
129	79	
130	87	
131	95	
132	103	
133	111	
134	119	
135	127	
136	135	
137	143	
138	151	

Appendix C Color Comparison		
AutoCAD Color No.	MicroStation Color No.	Screened Color
139	159	
140	167	
141	175	
142	183	
143	191	
144	199	
145	207	
146	215	
147	223	
148	231	
149	239	
150	40	
151	72	
152	88	
153	104	
154	136	
155	152	
156	184	
157	216	
158	232	
159	248	
160	17	
161	25	
162	33	
163	41	
164	49	
165	57	
166	65	
167	73	
168	81	
169	89	
170	97	
171	105	
172	113	
173	121	
174	129	
175	137	
176	145	
177	153	
178	161	
179	169	
180	177	
181	185	
182	193	
183	201	
184	209	

Appendix C Color Comparison		
AutoCAD Color No.	MicroStation Color No.	Screened Color
185	217	
186	225	
187	233	
188	241	
189	249	
190	245	
191	128	
192	144	
193	160	
194	176	
195	192	
196	208	
197	224	
198	240	
199	254	
200	13	
201	29	
202	21	
203	45	
204	37	
205	61	
206	53	
207	77	
208	69	
209	93	
210	85	
211	109	
212	101	
213	125	
214	117	
215	141	
216	133	
217	157	
218	149	
219	173	
220	165	
221	189	
222	181	
223	205	
224	197	
225	221	
226	213	
227	237	
228	229	
229	253	
230	91	

Appendix C Color Comparison		
AutoCAD Color No.	MicroStation Color No.	Screened Color
231	99	
232	107	
233	115	
234	123	
235	131	
236	139	
237	147	
238	155	
239	163	
240	171	
241	179	
242	187	
243	195	
244	203	
245	211	
246	219	
247	227	
248	235	
249	243	
250	8	Yes
251	200	Yes
252	168	Yes
253	120	Yes
254	56	Yes
255	24	